JPRS-WST-84-003

16 January 1984

West Europe Report

SCIENCE AND TECHNOLOGY

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16 JANUARY 1984

WEST EUROPE REPORT

SCIENCE AND TECHNOLOGY

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WEST EUROPE REPORT

SCIENCE AND TECHNOLOGY

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FRANCE DEVELOPS OWN ALUMINUM-BASED COMPOSITE CERAMIC

Paris INDUSTRIES & TECHNIQUES in French 1 Sep 83 pp 9, 10

[Text] Introduced by D. Turpin, P. Goeuriot, and F. Thevenot, researchers at the National School of Mines of Saint-Etienne, aluminalon is a composite ceramic material. As its name suggests, it is a composite material based on aluminum oxide, with dispersion being provided by BN hexagonal boron nitride or Y aluminum oxinitride produced in situ. Many laboratories throughout the world are carrying out intensive research on composite ceramic materials, using considerable resources. The reason is that they present many advantages: hardness, mechanical toughness, resistance to thermal shock etc. Their potential for application is very broad: high speed machining of steel or cast iron, use of ceramic in internal combustion engines in order to reduce their thermal loss. Use of ceramic in turbine blades in order to increase the temperature in industrial gas turbines and in jet engines for use in aircraft.

Increased Resistance at 1,400 Degrees Celsius

Aluminalon is completely competitive with other composite materials and in addition, it offers the non-negligible advantage of being French, which results in freedom from dependence on foreign sources in this leading-edge area. Another equally important advantage is its price, since aluminalon is made from aluminum oxide and aluminum nitride which are non-strategic materials with a relatively low cost, even when high purity is required. It should be noted, however, that the production method in use today is rather costly. Mrs Turpin used compression under heat, and compressors capable of achieving several Kbars at 1,500 to 2,000 degrees are not common and either American or Swedish. However, the authors of this innovation believe that it will soon be possible to produce aluminalon with a sufficiently high density using a more traditional method: cold compression followed by heating at high temperature. The development of this process will require new studies since many parameters remain to be determined in this case: temperature, duration of the various stages, compositions, nature and composition of the initial mixture.

But the researchers are optimistic and have even applied for a patent, so promising are the characteristics of this material, particularly the aluminum oxide/aluminum oxinitride composite. Its properties at ambient temperature are those of a good grade of aluminum oxide, but the resistance to

rupture and toughness either remain stable or improve as temperature increases. Thus at 1,400 degrees the material exhibits a better behavior than at ambient temperature, and is on a competitive level with all the newer types of ceramic under study today. The resistance of this material to oxidation is remarkable even at 1,200 degrees. The composition, the structure, and the method of production of aluminalon are, of course, not really original, but in rewarding the School of Mines of Saint-Etienne, the jury of the Technological Innovation Competition has sought to emphasize the logical character of this research, which results in a low cost composite material with an assured industrial future.

6445
CSO: 3698/193

AUTOMOTIVE INDUSTRY

FIAT CONDUCTS R&D IN CERAMIC PARTS FOR DIESEL ENGINE

Milan SCIENZA E VITA NUOVA in Italian Jun 83 p 100

[Text] It is not unlikely that within a short time we shall be seeing FIAT diesel 127s and Ritmos with some ceramic engine components on Italian highways. The FIAT Research Center several years ago started a design and experimentation program on ceramic materials, and it has already announced several breakthroughs.

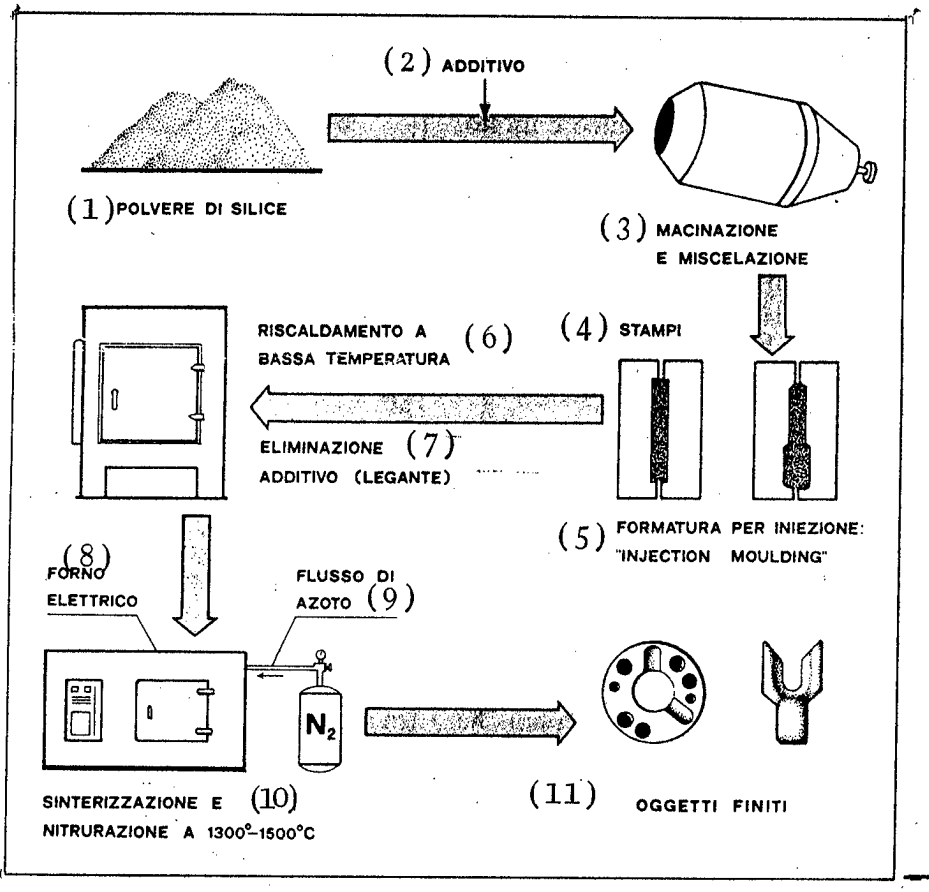
The substance they are working with is silicon nitride, which can be sinterized in either of two ways: sintering under hot pressure, starting with silicon nitride powder, or reaction sintering, which uses only silicon dusts. In the latter process, the nitrogen is added after the reaction phase, during the period while the material is being "cooked."

The advantages inherent in this second process, which is shown graphically on the diagram below, are manifold.

In the first place, the initial cost of silicon powders is one tenth that of silicon nitride; in the second, the material, after it comes from the oven -- for extremely complicated reasons -- undergoes only microscopic shrinkage in volume (although there is massive shrinkage during the cooling phase of conventional pressure-sintering processes), which means that it needs no machine finishing, but can be used immediately as it comes from the oven. That particular feature becomes still more attractive when the contemplated end-use is large-run mass production.

When we turn our attention to a comparison between ceramic materials and very strong ones, we find that pressure-sintered silicon is highly resistant to tensional stress, close to the levels of titanium and stainless steel, whereas silicon nitride obtained by reaction sintering is, in this case, markedly inferior in strength. However, once the temperature rises above 1400°C, reaction-sintered silicon nitride outclasses even the strongest metals in mechanical strength.

MAKING A CERAMIC COMPONENT BY REACTION SINTERING



KEY:

(1) Silicon powder
(2) Binder additive
(3) Grinding and blending
(4) Forms
(5) Injection molding
(6) Low-temperature heating
(7) Elimination of binder additive
(8) Electric oven
(9) Nitrogen flow
(10) Sintering and nitridation (at 1300-1500°C)
(11) Finished components

The diagram shows the key steps in the reaction sintering process. Silicon powder is ground and blended with the binder; the part is then formed by extruding the powder into a form where it is compressed. The binder is the removed by moderate re-heating, and is moved to the electric oven where, in addition to being cooked at a temperature of about 1500°C, the silicon powder is made to react chemically with a flow of nitrogen to form silicon nitride. The components emerge from the oven ready for use, requiring no machine finishing or policing. These components have performed well for the automotive industry.

Consequently, for these and other reasons, FIAT is moving toward production of ceramic components for diesel engines, using reaction-sintered silicon nitride. Already in production are such components as pre-combustion chambers, piston sleeves, and preheating sparkplugs. Tests run by the Center have shown that heat and mechanical stresses to which the materials are subject during engine operation have cause no deterioration in the ceramic compounds.

6182

CSO: 3698/182 (1)

BIOTECHNOLOGY

SCHERING'S ASMIS ON BIOTECH RESEARCH

Duesseldorf CHEMISCHE INDUSTRIE in German Aug 83 pp 429-430

/Interview with Dr Herbert Asmis, member of the board of Schering AG, in charge of research/

/Text/ CHEM. IND.: First, we might perhaps take stock. Where in the Schering domain, including Diamalt AG, has there so far been work in biotechnology in the broader sense, i.e. the synthesis of chemical compounds by means of microorganisms?

Asmis: Microbiology is used at Schering in various stages of steroid synthesis. Based on his experience in the United States, my predecessor, Dr Raspe, established a microbiological laboratory in Berlin more than 20 years ago. Since then, various phases of steroid syntehsis were carried out by fermentation, at first in research and then in production. In a second construction phase, we built fairly large fermentation plants in Betgkamen. Materials are also produced there for our subsidiary Diamalt, which does not have its own microbiology section at this time. Further development of the microbiology plants is planned.

CHEM. IND.: Is your company engaging in further research in this "classical" area of biotechnology?

Asmis: Of course. We have research laboratories in the Charlottenburg plant, and we have experimental fermentation set-ups that are closely connected with chemical syntehsis in our main plant in Wedding. Specific improvements in procedure are being developed according to the mutation/selection principle. We regard chemistry and microbiology as our basic production techniques. Even so, microbiology never developed as much here as in other firms because we are not active in the antibiotics area.

CHEM. IND.: Does your microbiological research encompass steroids only?

Asmis: We follow every microbiological course that presents itself parallel to a chemical synthesis. At the moment, there is no such course. For the time being, steroids and their intermediate products are the main area of our microbiological activity.

Germ Cell of Genetic Engineering

CHEM. IND.: Let us turn to what is now called genetic engineering. Since when has Schering worked in this area?

Asmis: A small group has been working on genetic engineering research since about the first half of the seventies. At the time, we worked in conjunction with the Federal Ministry for Research and Technology and the Max-Planck Institute, trying to develop the first methodological approaches to genetic engineering based on the example of insulin. We later gave up insulin because we had in the meantime mostly withdrawn from the diabetes market, and also because others were ahead of us. We then worked with other proteohormones, but also with metabolites, such as L-amino acids, to the extent that this could be done with the relatively small work group. Moreover, in recent years, we received offers to work with genetic engineering firms. We rejected all of these because we are not interested in minimum participation. Also, many of these companies adhere to the "black box" principle. You can have access only to a very small segment of the work area. But we would like to acquire the broadest possible know-how.

Over time, we were constantly faced with the decision as to when we would enter this area on a fairly large scale. Once a decision has been made to work in genetic engineering, it must at some point be on a fairly large scale. There are no rapid solutions for synthesis problems in genetic engineering.

During the past year we have gained the impression that genetic engineering has reached a stage where it is worthwhile to become more involved. And we decided that such involvement should be adequate.

CHEM. IND.: What does "adequate" mean?

Asmis: For one, we must have broad access to basic research, so that we can train our associates in this field and also attract replacement personnel from the outside. This will take place at the institute that is planned jointly with the Berlin district. Secondly, it means that our work group at Schering will be expanded considerably so that several projects can be worked on simultaneously. Third, we must create possibilities for the technological transfer of genetic engineering. Starting points have presented themselves but this sector must be greatly enlarged. We are working for long-term prospects here.

Cooperation With Genex

In the medium range, we have also allotted funds for agreements with interesting companies on specific research projects. We are working with the American company Genex because this firm does not follow the "black box" principle. The company was disposed to much more open collaboration. Among the American genetic engineering firms, Genex is approximately fourth in terms of size and research capacity. But I would like to emphasize that the cooperative work with Genex does not involve a fixed relationship, as in other cases. Rather, it is a time-limited research project. We are entirely free to make similar agreements with other firms or research groups.

CHEM. IND.: What is involved in the Genex collaboration?

Asmis: I cannot go into detail. But I can say that the project is geared to obtaining a very specific amino acid. The second project involves preparation of a blood factor, i.e. a protein. The latter is important in the cardiocirculatory area. And since we are currently doing more work in this sector, it fits well into the general picture. Even if the project does not yield industrially useful results, we can acquire much information on principles from this extraordinary complex example. That is why we feel that constant exchanges of information and communication are so important in these research projects. I can already say this: Both the form and type of collaboration with Genex are good. Both projects are in the planning stage.

Let us assume that organisms are found which produce a specific amino acid or blood factor in adequate quantities. Even then, it is still very long until we have a therapeutically effective product or until we can economically manufacture a given chemical. In most cases, it is these subsequent phases which are underestimated.

We feel it is important for the results of our research projects to be as closely connected as possible with the production of our divisions. However, the total budget for genetic engineering is supervised centrally, by research and not by one of the divisions. This is important so that adequate funds can be applied specifically even when resources are limited.

Progress in Berlin Institute Project

CHEM. IND.: Let us turn to the planned Berlin Institute. I will make a brief summary of the known data: The district of Berlin and Schering AG have plans for the joint establishment of an institute to be devoted to research in genetic engineering. Its legal form will be that of a limited liability company and its emphasis will be on basic research in cellular biology. It is to function autonomously. However, Schering is to have the option on experimental results in return for compensation at market pricing. Three divisions with approximately 30 associates are planned. A total of DM80 million finance costs are planned for 10 years. How does the project look at the present time?

Asmis: Negotiations with the district of Berlin have reached the point where the agreements are ready to sign. Several problems have of course come up because this is an unusual project. This applies in particular to the joint financing. This has led to delays but I can say that the project is once again gaining momentum.

In many instances, the planned nature of the project was not fully understood. The institute must be open and it must not be regarded as an industrial institute. Otherwise, it could not maintain contact with the scientific world. But if it is open, Schering research cannot be carried on there. Consequently, product research in the narrower sense cannot be carried out there. The work of the institute must be in the precursor of product research, in basic research. The institute can certainly serve as a source for our scientific replacement personnel, and also as a place where our researchers can learn specific methods. But above all, it should be an intermediary for all parties the world over who might be interested in dialogue.

So far as the option for research results is concerned, details for the conditions have not yet been worked out. On the one hand, there should be no curbs on the institute.. On the other hand, we do not exactly want to support our competition.

CHEM. IND.: Were there any problems in connection with location?

Asmis: Yes. On the question of new construction or reconstruction of existing institutes, we had initially decided on reconstruction for reasons of cost. But all of the possible installations were built so unfavorably that reconstruction costs would have approached those of building a new facility. Current plans are for construction of a new building within the framework of an approved building plan on the grounds of the Berlin Max-Planck Institute.

That is an optimal solution, for a large part of the infrastructure is already available form the Max-Planck Institute and the nearby Free University. The project is currently being calculated on this basis so that concrete figures can be submitted to the Berlin Chamber of Deputies for approval of the funds.

CHEM. IND.: How is the personnel situation?

Asmis: A C-4 professorial chair is to be established and filled at the Free University. The science senator for the biology sector has made this position available.

Talks with the Free University have progressed to the point where the search procedure can be started. Of course we want the selection to be completed as rapidly as possible, since we would like the new director of the institute to be involved in its establishment.

CHEM. IND.: What are your thoughts about the time frame?

Asmis: We would like to be as flexible as possible. All divisions of the institute do not have to start work at the same time. We hope to be able to provide interim positions elsewhere for future institute associates who can be hired now. However, to mention a time, I think that the institute will begin its work in mid-1985.

7072
CSO: 3698/132

FRG JOURNAL ANALYZES STATE, PROSPECTS OF AIRBUS PROGRAMS

General Analysis

Duesseldorf HANDELSBLATT in German 25/26 Nov 83 p 25

[Article by M.H.: "Will the 'Little Airbus' Save the Big Program?"]

> [Text] Europe's proud bird, the Airbus, is increasingly the subject of conversation. New sales are lagging: worker layoffs are threatening in Hamburg, Bremen and Munich; Bonn is forced to grant larger credit guarantees--and after all that, the industry is looking for additional loans to develop yet another Airbus model, the A-320. But just as there was too much unjustified euphoria over this European joint venture in past years, there is today no reason for panic talk to the contrary. However, waiting for better conditions in world aviation is expensive--interest payments, for example, for more than 20 Airbuses which by year's end are still waiting for buyers at the Lemwerder airport near Breman; expenses caused by constantly increased production costs due to repeatedly shifting high and low volume production in the inflexible European work environment; and money which must be spent for continuous improvements of the products, which themselves have yet to become profitable.

Small wonder then that the Airbus partners, with hitherto unknown unanimity, urge the three governments concerned in Bonn, Paris and London to subsidize them heavily in developing a still smaller Airbus model, the A320, with about 150 passenger seats. Development costs are estimated here to be at least $1.7 billion. Should no additional partners be found, it would be up to the FRG Airbus partner, MBB, and/or the middleman Deutsche Airbus GmbH, together with the Bonn government, to come up with almost 38 percent of that sum. While in the development of the A 300 and its little sister, the A 310, MBB's "industrial contribution" amounted to 10 percent of development costs and 15 percent of product improvement investments, with the balance being prepaid by the FRG government (DM 1.3 and 0.74 billion for the two models), Bonn wants to increase the industry risk drastically to 25 percent for the A 320, while industry itself wants to limit it to 10 percent. It is thus easy

to understand why week before last Minister of Finance Stoltenberg had mixed feelings about development of this new aircraft model, though a public subsidy of DM 12 million seems relatively moderate. By 1988, development costs to be prepaid by him would amount to at least DM 1.5 billion.

Only the future can tell whether the assumption is valid that a wider range of choices, from a 150 to a 300 seater, would result in greater overall sales opportunities for the Airbus manufactuers. It is simpler in any case to offer a whole "family" of aircraft, rather than a long (A 300) and a short (A310) version only.

While only a short time ago it appeared that at least three competitors would fight for the 150-seater market, which between 1988 and the year 2000 should amount to several thousand aircraft, the sales potential here has grown considerably by McDonnell Douglas dropping out of the race and Boeing's reluctance to enter this market beyond an improved version of the 737.

In Bonn's Ministry for Economics, which controls the aircraft manufacturing industry, there is a more positive attitude toward this aircraft than there was 1 or 2 years ago. Among the Airbus manufacturers themselves as well as among their potential customers, the airlines, this development is now being regarded as being considerably more feasible and economic. The present A 320 design is significantly lighter in weight, has more modern systems and, most significantly lighter in weight, has more modern systems and, most importantly, will by 1988, when it is scheduled to go into service, have more fuel-economical propulsion units than could have been expected 2 years ago. But 1988 is the very last moment by which such an aircraft must be available; otherwise, many customers would just about be forced to go to firmly established Boeing products, even though by then they might no longer represent the technological state-of-the-art.

The fact which makes the impending decision a difficult one is that, apart from 2-year old orders from the two French airlines Air France and Air Inter, only the independent British Caledonian has decided in favor of this model. It would be most desirable if a second independent airline would, on its own initiative and without government pressure, bring the number of initial orders to over 100 aircraft. In contrast to Air France and its intra-French partner Air Inter, the German Lufthansa will not require a new aircraft of that size until the early 1990s, inasmuch as just now the short and medium-range fleet is being dramatically modernized by the 737 exchange and a big order for the smaller Airbus A 310 (6 aircraft delivered to date). Nevertheless, the Lufthansa engineers are convinced of the significant improvements in the economic operation of the A320 and support the project, without however being able to place an order 6-7 years prior to needing it.

Time is Short for Subcontracts

The reason the Airbus builders need the basic decision on a government loan right now, even though the aircraft will not roll out until 1988, is the fact that very soon the first orders to subcontractors for subassemblies will have to be placed, and construction will have to start on prototype production

facilities. This is the reason why Airbus salesmen are busy all over the world, not only to find new customers for the present production program, but also to identify those who even now might wish to make reservations for early delivery of the A 320.

Just the week before last an A 310 returned from its longest demonstration tour of the year to date. During a 34-day trip, it visited Hong Kong, the People's Republic of China, Papua-New Guinea, Australia, Singapore, Brunei, Malaysia, Abu Dhabi, Cyprus and Yugoslavia--a total flight of 48,000 km. In 21 demonstration flights efforts were made to convince air transport experts, members of governments, bankers and members of parliament of the excellent technological and economic characteristics of this youngest member of the Airbus family. The above names of countries indicate the variety of potential customers. Theoretically, about 150 airlines throughout the world could become Airbus customers. This gives added weight to the complaint by some airlines that the Airbus sales force is too small and not continuously available for consultation, as is Boeing's. Expensive demonstration trips are not a complete substitute therefore, even with support from French ambassadors.

There appears to be truth to the continual statements by Airbus purchasers and potential customers that this European joint product is doubtlessly superior technologically, though it has some pricing problems--but that it is at a significant disadvantage compared with its American competitors as to marketing, product support and after-sales service. This may be due to the overly accelerated growth of the second half of the 1970s, but is blamed also on the modus operandi of the top management of the holding company, Airbus Industrie.

It appears to be a fact that in the euphoria of success some grave mistakes were made at Airbus Industrie. For instance, proper weight was not given to the drastic loss of market share of the long-time market leader, Boeing, while underestimating the tough, though delayed, reaction by the U.S. competitors. Additionally, but for the "bureaucracies" in Bonn and London, a prematurely conceived version of the A 320 would have been marketed--the wrong aircraft at the wrong point in time.

Management and organizational deficiencies in Airbus Industrie are becoming primarily apparent in the current critical phase by a lack of timely adaptation to changing market conditions. The successes with the A 300 and A 310 served to camouflage the problems generated by the fact that the industrial partners were unable to place responsibility at the doorstep of Airbus Industrie management.

There would have been a way of at least partially preventing the existence of an unsold Airbus fleet, if Airbus Industrie had at the proper time taken steps to market used aircraft, so as to make it possible for some reasonably well-financed customers such as some of the Far East airlines to trade in their older Airbuses on the new, more economic products. Right now there are only 20 "white tail" airplanes; by next spring there will certainly be 30-40, costing hundreds of millions of dollars in interest payments.

The partner firms, the board of directors and the Airbus Industrie management should realize that they must not sit around like hypnotized rabbits, waiting for a better market for the Airbus product line, which will no doubt come about sooner or later. Rather, during the present crisis, obvious weaknesses in organization and marketing must be remedied. The present Airbus situation is a test for the continued viability of this largest of European joint venture programs. The fate of the European industrialized countries' aircraft industry does not only depend, as the saying goes, on the still missing financing commitments from Bonn and London for the A 320, but to a much greater extent on the creation of a more effective and responsible organization for production and marketing of that industry's civil aviation products.

At Risk: DM 12-13 Billion

That is the only way to limit the risk which the three countries' taxpayers have assumed for the sake of the European aircraft industry workers. Only then will the planned revenues of about DM 40 billion come to pass, when the magic number of 860 A 300 and A 310 aircraft can be sold by the middle of the 1990s. Only then will the German taxpayer see the return of the estimated DM 12-13 billion in program costs which were and are still being invested in the form of prepaid development costs, assumed guarantees and lost production and marketing subsidies.

Should it come to pass however, that instead of a more rigorous commercial examination of the Airbus program it would become even more strongly politicized ["the Airbus is a means of preserving the largest possible number of French jobs"), then the program could still collapse in the same manner as other joint ventures have in the past. That is another reason why it is so important that the A 320 become the best possible aircraft at a reasonable price. To build it strictly for reasons of job preservation could truly lead to the occasionally estimated losses of billions for the taxpayers involved and could end Europe's participation in this technology sector once and for all.

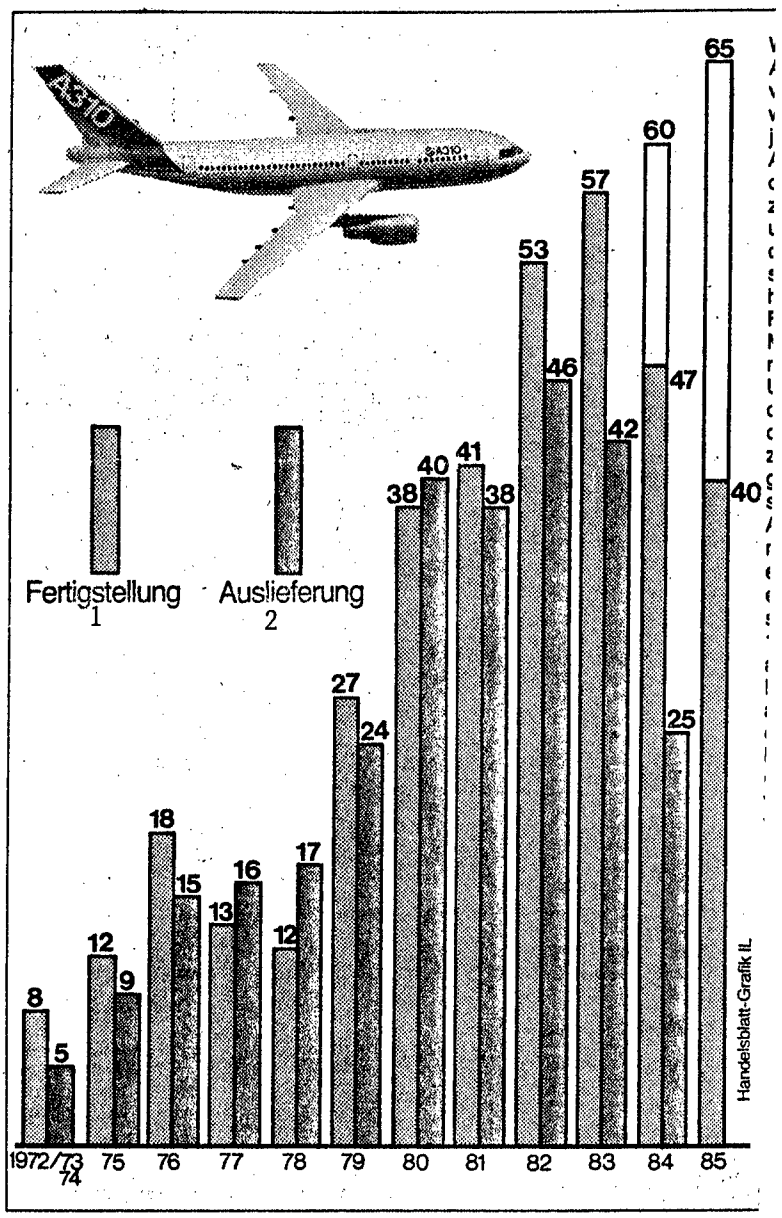
Airbus Figures

Federal loans for development costs (to be reimbursed by industry): For the A 300: DM 1.3 billion; for the A 310: DM 0.738 billion; Total: DM 2.38 billion [sic--correct total 2.038].

Guarantees: raised from DM 4.1 billion to DM 4.5 billion.

Production subsidies granted: DM 642 million.

Marketing loans: a gross amount of DM 2.044 billion has been approved for 340 aircraft. To date, about DM 350 million of this has been used. (This availability is needed in order to compete with Exim Bank terms).



KEY: 1. Completed
2. Delivered

While during the period 1975-1982 Airbus production was roughly comparable with contractually agreed upon delivery dates, there is a considerable difference now. A total of 280 airplanes have been produced, with 242 scheduled for delivery by the end of this year. This includes four prototypes; three airplanes whose delivery is only slightly delayed until early next year; but 21 genuine "white tails," among them four destined for Libya's Arab Airlines, whose delivery is prohibited by a U.S. embargo. For

1984, a recently made decision reduces the originally planned production of 60 aircraft to only 47, of which probably only 25 are covered by delivery orders, unless new orders suddenly come in. For the post-1984 period a further increase in production had been planned; but at present a reduction to only 40 airplanes is under discussion. This will not fail to have an impact on employment in German Airbus production facilities and will additionally result in the fact that expected mass production economies will not be achieved, thus requiring an increase in marketing assistance subsidies. That is why some oppose reduced production and consider it more economical for the government sponsors of the participating Airbus partners to assume interest payments for the ground-bound airplanes until such time as the confidently expected rush of orders occurs during the second half of the 1980s. After all, Airbus was once before unable to guarantee deliveries to potential customers in 1977/78 as a result of production cutbacks.

UK Remembers Concorde

Duesseldorf HANDELSBLATT in German 25/26 Nov 83 p 25

[Article by ag: "The Shadow of the Concorde Billions--Mrs Thatcher Has Second Thoughts About the 400 Million Pound Expenditure for the British Share of the A 320"]

[Text] London--In the mounting internal British controversy about the A 320 Airbus, Prime Minister Margaret Thatcher has called a spade a spade: "I don't want another Concorde," thus rebuffing members of the House of Commons who were pressing for a quick, favorable decision. The loss of billions in developing and building the supersonic transport throw a heavy shadow over the upcoming Airbus decision.

The issue for the government is to grant loans and subsidies amounting to more than 500 million pounds (DM 2 billion). British Aerospace, one of the partners in the Airbus consortium, wants 400 million pounds (DM 1.6 billion) in "reimbursable" startup loans for the A 320. There is an indirect connection between the Airbus and a new project to develop, as an international joint venture, a new aircraft propulsion system which would be suitable for the new aircraft. Rolls-Royce has requested an initial government loan of 13 million pounds (DM 450 million) for development startup costs.

Pressure is not being brought to bear by industry alone. The labor unions have started a campaign designed to make Mrs Thatcher give the go-ahead. Ken Gill, one of their representatives, accuses the conservative government of creating a vicious circle which will eliminate the country from the international aircraft manufacturing business: Mrs Thatcher, he says, does not want to finance the new Airbus because there aren't enough orders for it; at the same time, the national British Airways has failed to place orders and instead has leased American Boeing airplanes so as to make quick profits prior to passing into private ownership. Without the little Airbus, he continued, the British aircraft industry would soon be reduced to merely selling spare parts for American aircraft. Opponents, writing mainly in the conservative press, have quite a different view. Only a very few civil aircraft, they

say, have made money since World War II. Even successful ones like the Boeing 747, the DC-10 and the A 300 Airbus still have a long way to go before earning their respective development costs. In view of the probable worldwide demand for A 320 type aircraft, amounting to about 500 between 1989 and 1995, the little Airbus could become profitable only if it had no competition.

Airbus Strategy Confirmed

Duesseldorf HANDELSBLATT in German 25/26 Nov 83 p 25

[Article by je: "After McDonnell Douglas' Announced Termination of Civil Aircraft Development, Airbus Finds Its Own Strategy Confirmed"]

[Text] New York--Airbus marketing representatives in the United States feel that, in view of McDonnell Douglas' decision to terminate development of two civil aircraft types, their strategy has been proven correct. In an interview with HANDELSBLATT, the Airbus Industrie chief in America, Patrick Croze, declared that undeniably the development of the medium-range A 320 jet with about 150 seats is of crucial importance; deliveries are to start in 1988.

McDonnell has abandoned development of the City jet, the 120-seat MD-90. Says Croze: "This confirms our opinion that in this market there is little to be gained by competing with the Boeing 737." Potential demand for a wide-body long-range aircraft, he continued, where McDonnell terminated development of the DC-10 successor, the MD-100, is limited also. In this category, Airbus does not plan to come up with a model of its own until 1990 or 1992 and expects a worldwide demand for about 400 units until the end of the 1990s. On the other hand, the market potential for the 150-seater until the year 2000 is estimated to be 2,000 to 3,000 aircraft. Even though since Lockheed's bailing out and McDonnell Douglas' termination of development the construction of large-scale civil aircraft has been restricted to the American Boeing and the European Airbus Industrie, the biggest market, the United States, has been all but closed to the Europeans. Only Eastern Airlines placed an order years ago for 34 A 300s at bargain rates; 30 have been delivered to date. There were no subsequent orders; most recently, Eastern returned to Boeing with orders for modern medium-range equipment. However, the planned delivery schedules for the B757 have in the meantime had to be stretched out due to financial difficulties. "Nevertheless," says Croze, "we hope some day to sell more airplanes in that market also." In addition, he cautioned against writing off McDonnell Douglas as a civilian market contender: "That mistake was made once before, 2 years ago, when there were problems with the DC-10. The manufacturer then came back with an aggressive and successful campaign for the DC-9-80." Inasmuch as MDC plants on the West Coast have for some time been plagued by strikes, an announcement of this sort may well have been made for "educational purposes."

9273
CSO: 3698/183

BRIEFS

ESPRIT SOFTWARE STUDY--CERCI's (Center for Industrial Cybernetics Studies and Fabrications) proposal to participate, as part of the Esprit project, in a research program on software engineering, has just been accepted by the Commission of European Communities. This program, named SPMMS (Software Production and Maintenance Management System), is devoted to the management of software production and maintenance. The Esprit program involves two or more enterprises from a minimum of two Community countries; in this context, CERCI will cooperate with the British company Standard Telephone and Cables, the Dutch company Consuldata, and the Italian company Data Management. This operation is part of Esprit's preliminary phase. [Text] [Paris ELECTRONIQUE ACTUALITES in French 18 Nov 83 p 13] 11,023

CSO: 3698/166

FRENCH DEVELOP SOFTWARE FOR FACTORY MACHINE TOOLS

Paris INDUSTRIES ET TECHNIQUES in French 10 Sep 83 pp 91-92

[Article by Franck Barnu: "Numeric Control: Turnkey Software Available With Four Programs for Geometry, Lathe Work, Milling-Drilling, and Punching-Nibbling"]

[Text] More and more, computer-controlled systems are replacing manual programming in numerically controlled machine tools. The advantages: incomparably faster speed and much greater efficiency, with punched tape output usable in production almost immediately.

PSI, the program developed by CETIM (Technical Center of Mechanical Industries) was already known and distributed by GRAPHAEL company. Today, the company offers PSI-2, an improved version, marketed in the form of a turnkey system including both hardware and software.

Why a new program? First, because PSI dates back from 1975. Since then, numerically controlled machine tools have evolved, and this evolution must be taken into account. "Rather than patch up an older program, it is better to develop an entirely new product and also avoid the usual drawbacks of constantly modified programs" says the producer.

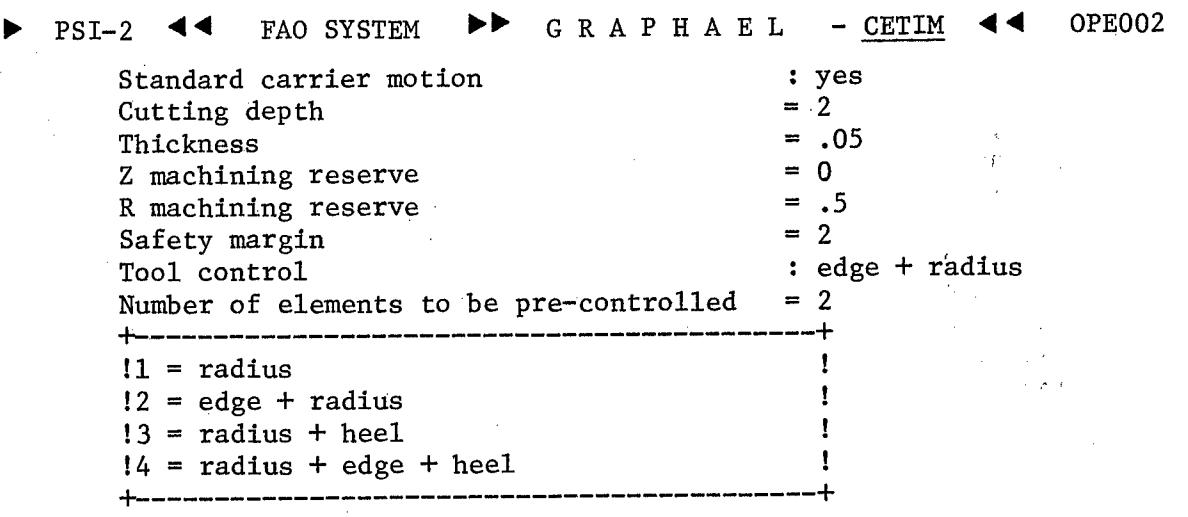
This does not seem like a bad idea, because by recoding and optimizing its software, the company has produced a set of programs that are faster, more powerful, and require much less storage space. This second version also corresponds to a re-direction of its application field. PSI-1 was designed with a wide objective, taking into consideration tool trajectories and machining optimization. In the name of the principle that trying to accomplish too much achieves poor results, it was deemed preferable to divide the problem into several areas: PSI-2 will henceforth only handle computation and machining simulation. Cut conditions are left to the care of AUTOGAM, another CETIM program. PSI-2 includes four programs: geometry, lathe work, milling-drilling, and punching-nibbling and can handle any single-plane machining operation (two simultaneous axes). There is an adaptation program for each type of machine tool.

Training in 2 Days

The hardware includes a Wang 2200 mini-computer (CETIM's initial choice), an alphanumeric console for data input, a black-and-white graphic screen

(800 x 512 points) for display of tool trajectories, a tape reader-punch, a PERIFERIC ZIP 30, and a modem for remote control. The computer's base memory includes 64 K-bytes for the main memory, 1 megabyte on a diskette, and 2 megabytes on a Winchester hard disk. The system sells for FF 230,000 in the basic configuration, including on-site installation and training. This price seems reasonable, even for a small or medium size company, especially since the mini-computer may be used for other applications, if it is not used full time for numeric control. It should be noted that several workstations may be connected to the system which also supports display screen hardcopy printers, curve tracers, digitalizers, etc.

This "French-speaking" system uses the conversational approach selected by CETIM for their "Methods" programs. The machine asks a series of questions that the operator has to answer, so that the operation of PSI-2 can be learned in only 2 days of training. During the dialog, the operator has to describe the geometry, and then the machining of the part to be processed, while the contours of the part are displayed on the screen as well as the tool shape and trajectory. A profile generator handles the definition of the contours of the parts, the tools, and the tool-holders. Once the contours are defined, they are stored in a library included in the software. The work proceeds step-by-step since the control of the data, as well as the results, is instantaneous. A ready-to-use punched tape is obtained directly. In addition, conformity between the information punched on the tape and the data inputted on the console is assured by a read-back system included in the reader-punch. It should be finally noted that GRAPHAEL has implemented a possibility of connection of PSI-2 to their SUMMADRAFT computer-aided drafting system. In some installations, connection to the RACAL REDAC systems and the EUCLID program has also been accomplished. The company also claims to be ready to accomplish this type of connection to any other computer-aided drafting system, an interesting proposition if the computerization of the "Methodes" programs is to be carried out within the scope of computer-aided design and production systems.



Example of an operator-machine dialog for the definition of a machining operation. One of the advantages of the system is in its conversational approach. Furthermore, it speaks French.

6445
CSO: 3698/198

FOREIGN-OWNED ELECTRONICS COMPANIES FLOURISH IN IRELAND

Oslo AFTENPOSTEN in Norwegian 6 Dec 83 p 37

[Article by Ulf Peter Hellstrøm: "Ireland In Transformation, I: Electronics Industry Growing"]

[Text] Seventeen thousand workers are now employed in the strongly expanding Irish electronics industry. This sector of Ireland's industry is dominated by big foreign companies which have established themselves in Ireland because of the very favorable tax and financing conditions. Exports in the billions of computer products and electronics are very important for Ireland's 3.5 million inhabitants, not least as a contribution to straightening out the country's foreign trade balance. After a powerful drastic economic remedy the big foreign trade debt is in the process of being reduced and the foreign trade deficit is expected to be only three percent this year.

The electronics industry is perhaps the area of Irish industry which has shown the biggest expansion in recent years, Division Director Eamonn Ryan of the Irish development directorate IDA, the Industrial Development Authority, tells AFTENPOSTEN. While the number employed in this industry was 7700 in 1977, it is expected that over 28,000 Irishmen will work in the industry in 1985. In 1982 this industry produced goods and services for a total value of about 1.2 billion Irish pounds, which is over 10 billion kroner. By far most of the products are used for export.

Ireland's gross national product amounted to about 111.7 billion kroner in 1982. In comparison, Norway's GNP was over 360 billion. A good 30 percent of the Irish labor force is employed in the country's industry, while 17 percent work in agriculture. If the gross national product is split up among the different sectors, it can be seen that Ireland's agriculture, however, accounts for only 9.9 percent of the country's combined GNP. For Norway, activities in agriculture account for 14.3 percent of the GNP, although only 8.5 percent of the labor force here in the country is employed in agriculture.

Norway's exports with their good 111 billion kroner are easily twice as large as Ireland's good 52 billion. However, Ireland has an export trade surplus with Norway, for the country in 1982 exported to Norway goods and services for a good 296 million kroner, for the most part office and computer equipment, foodstuffs and textiles. In the same year Ireland imported Norwegian goods

and services for about 206 million kroner, mainly lumber and wood finishing products.

Trade Deficit

As late as 1981 Ireland's trade deficit was up at 14.3 percent, measured in relation to the country's gross national product. To the question of how the country could have such a situation, the country's industry and energy minister, John Bruton, says quite curtly to AFTENPOSTEN, "Very poor management."

The expanding public sector has now been slowed down, but big foreign borrowing has entailed the fact that an important part of budgets contributes to interest and instalments. In addition, Ireland is still rather poorly developed in several areas, although the infrastructure and educational system are constantly being improved. The result has been public disbursements which presuppose a high and rather unpopular tax level.

Both the country's politicians and voters are placing their trust in the young expanding electronics industry's, in this traditional agricultural society, procuring for the country a trade surplus and export revenues. In addition, Gulf Oil's oil find off the south coast of Ireland has increased hopes for a commercially profitable oil field which can at least cover Ireland's modest demand for oil.

U.S. Dominance

It is the American computer companies which are dominating among the larger electronics concerns in Ireland, but Japanese multinational concerns have also added some mass production to the country. Among manufacturers of computers are found American companies like Apple, Amdahl, CPT, Prime and Wang. The biggest computer concern in the country is operated by DEC, which employs a good 1000 people and manufactures minicomputers of the VAX type and smaller models. The Japanese companies Fujitsu and NEC have assigned some of their production, assembly and testing of integrated circuits to Ireland. On the telecommunications side there are both Northern Telecom and, not least, the Swedish L.M. Ericsson concern, which together with French CII Alcatel is to supply telephone exchanges for the country's telecommunications system.

When the Norwegian-American Gene Amdahl and the Trilogy company in about two years get started on series production of their very fast big computer, production will be assigned to Ireland.

IDA claims that the foreign businesses are creating fertile soil for new Irish business environments and that the management profile in the electronics industry, for example, is getting stronger Irish elements. One example of this development is Roy T. Houston, the Irish administrative director of Floating Point Systems, Ltd., an American minicomputer company which specializes in fast computers for special purposes (the equipment is based on so-called serial processors which perform different tasks simultaneously).

"We have 74 employees and every fifth one is an engineer. All are Irishmen. Volume production of the expensive products is relatively low, while testing takes a lot of time. This is a rather labor-intensive branch," Houston says. Four of the engineers, besides, have been called to headquarters in the USA to partake in development work. Both Houston and IDA believe that these numbers and examples say something about the Irish labor force.

Low Corporation Tax

A main element of the Irish tax and duties package which is attracting foreign capital is a very low corporation tax. The maximum limit is 10-percent withholding tax. This tax policy has been approved by EC and the guarantee is in effect to the year 2000.

The Irish development directorate IDA has been central in implementation of this industrial policy, not least since the directorate became an independent government agency in 1970. It is IDA which is channeling big government subsidies to foreign new businesses and expansion in Ireland. The directorate covers from 45 to 60 percent of capital expenditures associated with setting up a new business, regardless of where the new business is located. In addition, there are subsidies for training and educational programs for employees, something which is often necessary in a country which until recently has not had a special tradition as far as extensive industrial activity is concerned.

"Ireland is a young country with a labor force which is well educated. We have the highest population growth in Europe and an energetic rallying of technical education through new technical university colleges in Dublin and Cork," Eamonn Ryan says.

8985
CSO: 3698/179

MICROELECTRONICS

DANISH ELECTRONIC EQUIPMENT ONBOARD SPACELAB

Copenhagen BERLINGSKE TIDENDE in Danish 30 Nov 83 p 13

[Article by Michael Rastrup Smith: "Danish Electronics Onboard Spacelab"]

[Text] The director and space division chief of the Danish Terma electronics firm was present at the takeoff of the space shuttle Columbia from Kennedy Space Center in Florida. Terma and the Kampsax and Christian Rovsing firms have been deeply involved in the project for years. The problems have been well solved and everything is functioning perfectly, they report from Florida.

NASA's smoothest launch to date. Director Johannes Jacobsen of Terma Elektronik [Electronics] and his space division chief, Ove Lundorff, are without reservations. The space shuttle Columbia with the Spacelab space laboratory on board is a big success.

The two Århusians were as close to the space shuttle as it is possible to go when it was launched on Monday. From their seats in the VIP box they saw the most perfect space launch to date.

Perfect Launch

"The space shuttle was launched from Kennedy Space Center with the shortest delay ever. When the rocket lifted Columbia with the six people on board it was only four to five tenths of a second after the planned departure time. It is simply impressive," Terma's Director Johannes Jacobsen says.

Three Danish firms have been involved in the 10-billion-Danish-kroner American-European space travel program, where the American space shuttle is carrying the European Spacelab space laboratory, which contains a number of scientific experiments from several different countries in Europe and America.

Kampsax and Rovsing

The Danish contracting firm Kampsax, with the Christian Rovsing A/S electronics firm as subcontractor, made computer programs for the space laboratory. The programs were used to test Spacelab while it was still under construction in Europe, but also while it was being made ready in the USA.

But the Århus Terma electronics firm is also represented in the joint space travel project:

"We have two types of equipment onboard Spacelab itself. It includes part of the power distribution in Spacelab and the equipment which Danmarks Tekniske Højskole [Danish College of Engineering] is using for its experiments on growing crystals in space," the chief of Terma's space division, Ove Lundorff, says.

He relates that all the equipment which Terma supplied for Spacelab was activated precisely 20 minutes after the start from Kennedy Space Center. Everything is functioning as intended.

"The only problems there have been up to now are that one of the astronauts has had travel sickness and that this has caused difficulties in communicating with some of the equipment located on a pallet in free space behind Spacelab," Director Johannes Jacobsen says.

He relates that the Americans noticed that the European Spacelab was ready on time when the trip had to be postponed at the last moment a month ago because problems arose with the space shuttle. This has created respect for Europe.

8985
CSO: 3698/177

EARNINGS BY SECTOR FOR 1982 OF THOMSON, EFCIS

Paris MINIS ET MICROS in French 1 Sep 83 p 28

[Text] Thomson: in 1982, the gross income for the group was FF 46,500 million (a loss of 2,500 million), 46 percent of which went for export. Its activities were distributed in the following areas:

--General sales	32 percent
--Communications	25 percent
--Detection systems	18 percent
--Engineering	9 percent
--Components	9 percent
--Medical equipment	7 percent

The components department employs 15,100 persons and its 1982 income was FF 3,850 million. Activities within this branch are divided as follows:

--Semiconductors (17 percent EFCIS, 17 percent discreet components)	34 percent
--Displays	24 percent
--Passive and hybrid components	19.6 percent
--Connectors	12.2 percent
--Hyperfrequency components	6.3 percent
--Piezoelectric components	3.9 percent

EFCIS (Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux) employs 2,215 persons and its 1982 income was FF 570 million (59 percent for bipolar components and 41 percent for MOS). In 1983, the anticipated income will be FF 702 million, or an increase of 23 percent. The activities of EFCIS are distributed as follows:

--Specific circuits	31 percent
--Telecommunications	23 percent
--Systems	19 percent
--Microprocessors and peripherals	18 percent
--New products (graphics)	9 percent

6445
CSO: 3698/193

MARKED INCREASE IN THOMSON-CSF SEMICONDUCTOR ACTIVITIES

Paris ELECTRONIQUE ACTUALITIES in French 2 Dec 83 pp 1, 15

[Article by J-P Della Musia: "Thomson-CSF Semiconductor Activity Takes a New Start"]

[Text] EFCIS [French Company for Integrated Special Circuits] has become unrecognizable, and so is the whole of the semiconductor policy at Thomson-CSF. Beyond the company's personnel changes, which have sometimes been spectacular, some details show that Thomson's semiconductors activity is progressing from a mainly national dimension to an international one:

--In 1983, the number of sales engineers has increased 50 percent in the semiconductors export area (anticipated income in the U.S.: $30 million in 1983);

--From the first to the third quarter of 1983, EFCIS' production has increased from 300,000 circuits per month to 1.2 million circuits per month;

--Not a single integrated circuit sold by Thomson is any longer sourced outside Thomson;

--All members of Thomson-CSF's management we have met during the last few weeks have recovered the kind of faith which can only be found, in the European semiconductors business, at SGS. Many are now speaking of a "new challenge," and to top it all, their last sales meeting, which took place on a Sunday, was conducted in English.

Official pronouncements about this change are rare: let us recall that Thomson's components division has made the decision from now on to demonstrate before announcing (see ELECTRONIQUE ACTUALITIES 11 Nov 83). But the final objective has been disclosed: Thomson Semiconductors intends to capture 3 percent of the world market in its area by 1990 (as compared with 1 percent in 1982). Putting together information from various sources has shown us that Thomson is now on the path which should lead them to that goal. It also shows, however, that to reach this objective will require cumulated investments of close to FF 1,000 million between now and 1990. Will Thomson and its stockholders be able to sustain this hot pace?

Gross income: a 35 percent increase in one semester

Currently, three factors are contributing to a steep increase in Thomson's (EFCIS, Bipolar integrated circuits, Eurothechnique, and discrete components) gross income: the worldwide recovery which operates both on prices and on demand; the rise of the U.S. dollar in comparison with the franc; finally, the change in direction which has given priority to production in all units. The result is spectacular: between the first and the third quarter of this year, invoice amounts have increased 20 percent for discrete components and 45 percent for integrated circuits, which corresponds to a weighted average of 35 percent, with resources remaining constant. Export now amounts to 50 percent (65 percent for discrete components) of the gross income which, in 1983, will reach about FF 1,485 million.

The Aix-en-Provence plant (discrete components) is now running at full capacity.

The bipolar plant at St-Egreve is capable of further increasing its deliveries. On the other hand, EFCIS and EUROTECHNIQUE have not reached full production capacity, but the progress is remarkable: as we mentioned earlier, the EFCIS production went from 300,000 circuits per month at the beginning of the year to 1.2 million in September. After reaching a million chips per month in mid-1982, Eurotechnique's production had dropped down to 600,000 in early 1983 after the take-over of the company bh Thomson, but climbed back to one million chips per month in September, and then to 1.3 million in October. (The time has not yet come for celebration, however: If the government had accepted National Semiconductors' proposal in mid-1982, investments would not have been cut-off, or almost cut-off, for a year and a half (they amounted to FF 40 million in 1983) and production today would not only reach 2 to 3 million chips per month, but products would be much more sophisticated than they are today: a 64 Kbit RAM, and a 128 K EPROM would already be in full production; Eurotechnique would thus be on the verge of being profitable.)

Men's Impact

Of all these figures, the increase in production at EFCIS is the most representative.

The ground had in fact been prepared for this increase to take place: the 68000, in particular, came out more than a year late, but is in full production today, using a slightly more advanced technology than Motorola's (this can be seen from the chip's surface, and its speed).

Many innovative circuits have been "in gestation" for a long time (too long); but today, they can be mass-produced and they will serve to make EFCIS known, in particular on foreign markets. Finally, the range of circuits in the 6800 family available from EFCIS is now wide and is in great demand from users.

The productivity impulse given by the new management team therefore came in at the right time. The man who provided this new start is, without question, M. Noels, previously chairman of the board of Texas Instruments France. He has been able, in the months following his arrival, to surround himself with a realistic sales director, M. Zanni (also from TI), and the base nucleus was

rapidly added to with well known people from the world of semiconductors who found in the new team, the opportunity to "finally do something worthwhile in the area of semiconductors in France." Today, the base is again solid on many points (men, products, the innovative potential of the Thomson group, the offensive in the export area, Mr Stark's (General Manager of the Components Division) determination and that of the stockholders, the MOS production growth potential at the Rousset site, the design team, the market prices and the increase in the market share; there remains the high debt level of the company).

But the most difficult part remains: in order to survive in the world of semiconductors and reach a minimum economy of scale it would benecessary to capture about 3 percent of the world market, according to Thomson sources. As a matter of fact, Thomson has established as its objective, to reach this goal in 1990. As we have already seen, this will require an investment of almost FF 10,000 million at today's value, over a 7-year period. Thomson Semiconductors is certainly planning not to incur any more losses starting in 1985 or 1986, but this is based on a world situation which looks favorable today. It is probably that a new semicondutors crisis will occur in 1986, and the activity may not be well enough established yet to avoid possible losses. Will the stockholders then resist the temptation to save money?

A gross income of FF 12,000 million in 1990?

The objective of capturing 3 percent of the world market by 1990 can be translated into numbers, at least in orders of magnitude:

By 1986, the world semiconductors market will probably amount to $30 billion, and there is no reason today to doubt that the average growth of 15 percent a year, based on constant currency value, experienced over the last few years, will continue beyond 1986. It can, therefore, be anticipated that the overall world market will reach $52.5 billion by 1990. Three percent of this market represents a gross income of $1,575 million, or roughly the gross income of the largest semiconductors producer of today. Assuming an average dollar value of FF 7,6 (which is pure conjecture, but it is necessary to establish a rate), the Thomson-Semiconductors gross income should therefore reach FF 12 billion at that time. Currently, it is necessary, in the semiconductors area, to invest 1 FF in order to generate a revenue of 1 FF (including buildings). In 1983, the gross income for this activity will be FF 1,485 million, and it will therefore be necessary to invest FF 10 billion over a 7-year period in order to reach the desired objective. (It is possible, moreover, that the very fact of announcing this figure shows that the problem in the semiconductors area is at least as important as that in the steel or coal mining areas which each swallows up this amount of money within a one or two-year period only, whereas the resulting benefit for the country's well-being cannot be compared).

A gross income of FF 12 billion in 1990 represents, for Thomson-Semiconductors, an increase of 35 percent a year, as expressed in constant francs. In fact, everything leads one to believe that, in 1984, the objective will be reached; between the first and the third quarter of this year, the order backlog has increased 30 percent for discrete components, and 90 percent for integrated circuits, which represents a weighted average of +60 percent. Certainly, the

same levels should not be anticipated for 1984, because they result partly from an increase in orders (plus, as we have said, the increase in the exchange rate for the dollar, the prices, and the foreign recovery, which will be very beneficial for the gross income), but there is no reason to feel pessimistic. Everything also looks positive in the area of investments: if we consider the growth level we are assuming, the gross income should rise from FF 2 billion in 1984 to FF 2.7 billion in 1985, which means an investment of FF 700 million in 1984 (1 FF for each 1 FF increase in gross income).

In fact normally, investments in the components division of Thomson are expected to increase by 50 percent in 1984 and they amounted to about FF 500 million in 1983. Theoretically, semiconductors should count for 80 percent in these investments, which means that semiconductors could reap FF 600 million in 1984. This will, of course, be insufficient to catch up with the notorious level of under-investment in 1983, but will be in line with the anticipated growth curve especially since, at least in the case of MOS technology circuits, an increase in the production capability is still possible at the Rousset plant, without having to add either to the buildings or to the utilities (purified water, gas, etc.). Moreover, we have noted a strong desire to develop, in the short term, productivity before leading edge technologies. The result could be an investment cost of less than 1 FF for each 1 FF of gross income.

There remains one unclear factor: we do not know how the losses for the semiconductor activity at Thomson are accounted for. For 1982, we can estimate them at almost FF 500 million (FF 220 million at EFCIS, FF 150 million at Eurotechnique FF 35 million for the integrated bipolar circuits activity, FF 50 million for discrete components, or a total of FF 455 million minimum).

The government probably contributed FF 150 million in one way or another, within the scope of the arrangements for the take-over of Eurotechnique by Thomson, and FF 160 million to make up for EFCIS' losses, but we do not know how the rest of the deficit was covered. In 1983, losses will probably be reduced because of the low level of investments. On the other hand, the situation should improve in 1984. (Let us recall that officially, Thomson-Semiconductors is supposed to compensate for its losses as early as 1985-1986, in spite of a high level of investments.)

A Company with Semi-Specific Markets

In the future, Tomson intends to be neither a company with specific markets, nor a multi-products company. It is certain that in the case of important standard products, EPROM's will become the company's battle horse in the memory area although RAM's will also be produced (the objective is to source them outside the company with a purchased know-how and without losing money). In the area of microprocessors, the 6800 and 68000 families will be extended, as well as the COPS series. In the bipolar area, the main standard product will be the fast PROM.

On the other hand, Thomson will be a specificpmarkets company in the area of telecommunications display circuits (particularly modems). Semi-standard circuits will also be the object of a strong development effort.

6445
CSO: 3698/208

NETHERLANDS' PHILIPS EXPECTS GRADUAL PROFIT INCREASE

Rotterdam NRC HANDELSBLAD in Dutch 30 Nov 83 p 13

[Article: "Philips Expects Gradual Increase in Profits"]

> [Text] Eindhoven, 30 Nov--Philips expects in the long run to realize a yearly growth in sales volume of on the average 6 percent. The firm is also counting on a further gradual increase in profits.

Philips president Dr W. Dekker said this yesterday evening during a lecture before the Association of Investment Analysts in New York. During the first 9 months of this year, Philips's sales volume rose by 3 percent. Net profits amounted to 1.3 percent of sales.

According to Dr W. Dekker, the improvement in Philips's position on the world market is in part due to large-scale restructuring, especially in Europe, which cost approximately $500 million. As a result, 28,000 employees disappeared and 32 plants had to close their doors. Another 13,000 people changed employers because Philips sold activities in other lines of trade. Dr W. Dekker also pointed out the importance of the many cooperative relationships that Philips has entered into in order to be able to operate worldwide and continue to bear the rising costs of research and development.

He emphasized the fact that Philips has put further efficiency measures on its agenda. The firm has already succeeded in reducing the level of stores and supplies from 35 to 30 percent of its volume of trade. "We are striving for a level of 25 percent within several years," according to the Philips president. "A more efficient use of capital will not only reduce our financial burdens, but also lead to an improvement in our financial structure."

Dr Dekker pointed out in his speech that in the last 10 years America has become more and more important for Philips. From 1972 to 1982, the share of Philips's volume of trade realized in the United States rose from 10 to 23 percent. The number of Philips employees in America increased in that period from 12,000 to 50,000. American interest in Philips stock shares also grew explosively. At the moment, approximately 24 percent of all Philips shares are in American hands, against 3 percent several years ago.

12271
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MICROELECTRONICS

PHILIPS OPENS NEW GLASS FIBERS PLANT IN NETHERLANDS

Rotterdam NRC HANDELSBLAD in Dutch 30 Nov 83 p 13

[Article: "Philips Opens Glass Fiber Plant"]

[Text] Eindhoven, 30 Nov--Dr H. Lelieveld, director-general for industry at the Ministry for Economic Affairs, opened a new Philips plant for the manufacture of glass fiber today in Eindhoven.

Philips has had a test facility at its disposal since the beginning of last year, where 30,000 km of glass fiber could be made per year, but now is the first time that the firm will be producing glass fiber on a commercial basis. The production capacity of the new factory can be stepped up in several years' time to approximately 150,000 km per year. Almost 50 people will work there.

The first floor of the new business consists of dust-free space where the glass fiber is made using a manufacturing process developed by Philips. The second floor is completely taken up by special air cleaning and filtering apparatus.

The new plant can produce two types of glass fiber. First of all, the multimode with a 0.05 mm diameter core which is especially suitable for use in local telephone networks as a successor to the traditional copper wire. Secondly, the monomode fiber with a core diameter of only 0.001 mm and an even greater transmission capacity; it will be used primarily for main connections in telephone exchanges. The Dutch PTT [Post, Telephone and Telegraph] will use this new type of fiber for the first time in Europe in Rotterdam.

12271
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SIEMENS MAKES GLASS-CERAMIC MASK FOR ULTRATHIN SCREEN

Paris BUREAUX D'ETUDES in French Sep 83 p 32

[Text] This new glass-ceramic grid obtained through a photo-engraving process is about to relegate the present bulky television tubes to the museum and will provide unusual performance for some computer peripherals. Using this grid, Siemens has developed a 14-inch data display screen which is only 6 cm thick. This result has been obtained by combining the advantages of traditional cathode ray tubes, and those of recent plasma tubes.

Holes: Density and Small Diameter

One of the most important components of this new type of screen is the roughly 1 mm thick grid made of Foturan glass (a glass-ceramic material developed by Schott Glaswerke). The advantages of this mask are in the high hole density (800 per square centimeter), the small diameter of the holes (only .2 mm), and the reduced conic shape of the holes (2 to 4 degrees), which allow deep etching. One characteristic worthy of note for small structures: the hole depth may be several times the diameter.

This process is particularly useful for perforations with a minimum diameter of .05 mm, with the grid thickness varying from .2 to 2 mm. Schott is capable of producing screens as large as 300 x 230 mm.

The small size of the engraving on this new grid may result in applications other than that for which it was originally developed, the extra-thin screen currently developed by Siemens: ferrite support for magnetic recorders; print-guides for wire printers, nozzles for ink-jet printers; supports for image-amplifier tubes; high precision acceleration masks, etc.

6445
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FRENCH COMPANIES DEVELOP IMAGE PROCESSING EQUIPMENT

Paris ROBOTS in French Nov 83 p 6

[Text] The countour extraction tool is an instrument intended for the high-speed numerical analysis of images provided by a video camera.

The instrument represents an interface between the video camera and an information processing system.

Its originality lies in the following:

--the algorithm used which provides a synthetized representation of the contours using a minimum of meaningful data;

--the processing speed, since it operates within a half-frame scanning time.

Its characteristics allow the instrument to satisfy the requirements for operation in an industrial environment. This processing system may provide, in particular, a solution to inspection and localization problems occurring in industrial robotics, the performance of future robots being dependent, in large part, upon the quality and the speed of perception system.

An effort by the LAAS [Date Processing and Systems Analysis Laboratory] has resulted in the integration of a hardware version of the base algorithm. Implemented within a MATRA-HARRIS company system, the extraction function is entirely performed by a single integrated circuit.

This chip constitutes one of the main elements of the VISIOMAT visualization system developed by the MATRA company for its robotics applications.

In the future, the new MIDI-ROBOTS company will, within the scope of agreements with the CNRS (National Center for Scientific Research) handle industrial developments related to this product (software and hardware in particular).

Additional information: Write ROBOTS, reference number 152 (service provided to subscribers only).

6445
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'PUCE' PLAN OF FRANCE'S DIELI TO PROMOTE MICROELECTRONICS

Paris ELECTRONIQUE ACTUALITES in French 25 Nov 83 pp 1, 14

[Article by P. Schaeffer]

[Text] The prospects for the French components industry are good, and their chances of achieving the goals planned by the government are great, as long as the enterprises do not slacken or scatter their efforts. This is the major lesson learned by Mr Hirel, DIELI (Directorate of the Electronics and Computer Industries) director at the Ministry of Industry, following the success of the Salon des Composants (Components Show) which just ended.

For Mr Hirel, the program to promote the use of microelectronics, named the PUCE (microelectronic chip) Program, is the last element in a group of measures that are very favorable for the components industry.

Adopted by the government at the end of September, the practical features of this program are now well known; Mr Fabius recalled them during the Salon: encourage innovation in industrial products through the use of microelectronics, so as to improve the quality of conventional products and therefore the competitiveness of enterprises.

"This program," comments Mr Hirel, "will have the effect of eventually offering new outlets to the components industry. It should help improve the overall consumption of components in France, and allow our country to reach the consumption level achieved by our major competitiors in this field."

"Everything leads to believe that the French components industry will now be able to profit from all the measures that have been implemented for some time past," he added.

"In terms of resources, we first have the 3.3 billion francs over four years, allocated to research and development in the semiconductor sector, and the 800 million francs, also for research and development and over the same time period, devoted to the passive components sector. These offical figures thus concern only research. As for investments in actual enterprises, the industry benefits from two procedures: capital endowments for nationalized enterprises, and access to the Industrial Modernization Fund (FIM) for private enterprises."

"In terms of markets, and while components in France have most often been governed by professional electronics and telecommunications, the consumer products sector is now rallying in the wake of the new programs supporting television, hi-fi, and video recorders, or personal computers--which have had a good start, as well as a result of the automobile market, which has become a reality. The two large programs for widespread dissemination of the telephone directory (with Minitels) and for optical fiber cable networks, obviously play a large role in the development of the components market in France, just as subsequently will the effects of the PUCE program."

"Lastly," continued Mr Hirel, "among the good prospects are today's favorable circumstances, which should consolidate or improve the exportation of components."

Some Conditions

"Thus, there currently exist a number of encouranging factors for the French components industry," declared Mr Hirel, "and its chances are great as long as some conditions are respected."

"The first is stability. The directions for efficient work are now well established, and we must not deviate from them or operate erratically. At the same time we know that this industry requires a continuity in financial means, and that it must not drop below critical thresholds."

"The second condition is a recovery of the financial situation of enterprises, and a redoubled effort for productivity and sales. Productivity improvement can in fact be considered as a first priority since it determines the rest, given that our industries maintain a world class technologic level."

European Industry

Finally, and to raise one more point, Mr Hirel wishes that the French components industry would seek to form bonds with similar European industries.

"With the ESPRIT program, conceived by the European Community, the mentality of the European industries is beginning to change, each one finding opportunities to cooperate with the others. A new frame of mind which must be encouraged, is beginning to evolve, and all approaches must be explored. Our components industry must seize every occasion to do so," concluded Mr Hirel.

The 4 x 8

Concerning the 4 x 8, a shorthand way of describng the concept of shifts which can work on Sundays so that machines will not be stopped, and thus become ammortized over a shorter period of time, DIELI has thus far received no communications from professional organizations.

We know that this question was raised at the past Salon des Composants, but without knowing whether it concerned certain specific cases, such as the supervision of continuously operating automatic or semi-automatic machines.

The PUCE Program

The PUCE program, whose practical features have just been made public, is kin to similar procedures implemented in FGR at the beginning of 1982.

It is a program aimed at enterprises with less than 2000 employees, which want to incorporate microelectronics into their products in order to make them more innovative and improve their performance, and therefore render them more competitive.

The PUCE program is composed of two autonomous phases: feasibility and fabrication. An enterprise may be interested in one or the other, or in both.

The feasibility phase essentially consists of first establishing a diagnosis, most often in conjunction with an SSCM (Service and Counseling Company for Microelectronics). Some twenty of these companies currently exist, operating most often together with research laboratories or universities. Following the diagnosis (which may include a market study), a set of specifications is formulated for fabrication. Throughout this phase, the Ministry of Industry subsidizes two-thirds of the expenses up to a maximum of 70,000 francs (including taxes) per project.

The fabrication phase covers an extension of the feasibility phase, during which the study must be continued until the building of a prototype for tests and evaluation (a frequent situation in the development of specific gate array or custom circuits). For this phase, assistance consists of a repayable advance amounting to 50 percent of the total costs, except for investments, with a maximum of 300,000 francs (including taxes) per project.

For the two phases, the enterprise has a single intermediary, the Regional Directorate for Industry and Research, which must accept or refuse the project within two months.

The PUCE program stops with these two phases. An enterprise which then wants to begin an industrialization phase, can have recourse to other support procedures, notably to DIELI's "product contracts."

In the light of the success encountered by this procedure in Germany, DIELI hopes to soon receive between 150 and 200 such files to examine. We might recall that the PUCE program has an endowment of 40 million francs at its inception.

11,023
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FRENCH FIRM ANNOUNCES NEW TYPE OF THIN FILM RESISTOR

Paris ELECTRONIQUE ACTUALITES in French 25 Nov 83 pp 1, 17

[Article by JPDM]

[Text] At the Salon des Composants (Components Show), Sfernice (French Electro-Resistance Company) announced a new type of thin film resistor in the form of a chip, combining three characteristics which had never been seen together until now: temperature coefficient of +/-5 ppm degree C between -40 and +125 degrees C; time stability close to that of the bulk metal, namely 250 ppm typically; and a high degree of integration, with 100 kohm/sq-mm typical, and 600 kohm/sq-mm maximum. The creation of these reference resistors, RMK, should cause a small revolution in the world of high precision electronics, and particularly in the area of digital-analog and analog-digital converters.

Four Concurrent Technologies

Three resistor technologies are presently competing in the high precision field:

Thin, compact, metal film resistors, whose temperature stability can be as low as 5 ppm per sorting, and whose 2000-hours stability at 155 degrees C is of the order of 1200-1500 ppm; also available are models with a stability higher than 500 ppm, but their temperature coefficient is not as good;

Very high precision wound resistors which are of no interest here because of their shape and inductance;

Foil resistors which readily achieve a temperature coefficient of +/-5 ppm between -55 and +125 degrees C, and a 2000-hour stability lower than 500 ppm, but which require a large substrate area, and are consequently very expensive both to purchase and to use.

The new Sfernice resistor combines the best features of its competitors without apparent drawbacks. Its density is similar to that of metal film resistors, but its stability with time or its temperature coefficient is four

times better (2000-hour typical stability of 250 ppm at 155 degrees C). Its typical temperature coefficient is lower than +/-5 ppm and matching can be obtained to 0.2 ppm/degree C. The relative stability of two resistors of similar values, subjected to thermal and mechanical constraints, is announced as being "much lower" than 200 ppm.

The characteristics of the RMK resistor are similar to those of foil resistors, but the device requires less area. As a comparison, an R/2R 16-bit grid for an A/D (analog to digital) converter covers 9 sq-mm with RMK resistors, against 625 sq-mm for foil resistors.

The other characteristics of RMK resistors are:

Possible values from a few ohms to several megohms;

Precision of 0.001 to 0.0005 percent;

Available in the form of bare chips, chip-carriers, hermetic, plastic SIL, or encapsulated DIL packages (an R/2R 16-bit grid can be fabricated with 1.27 mm x 1.27 mm resistors);

Alumina, silicon, or glass substrates;

Power dissipation of 10 or 20 mW/sq-mm.

Double Cathode Sputtering

Sfernice is very secretive about the technology it uses. The company has nevertheless disclosed to the American press that it precleans the substrates with ion bombardment before a double cathode sputtering (with nickel-chromium metal). However, this information does not make it possible to guess at anything.

Sfernice in Strain Gauges

At the Salon des Composants, Sfernice has also restated its intention of entering the strain gauge market.

Several months ago, Sfernice had already announced that it intended to develop silk screened strain gauges by presenting its first results at various specialized shows, such as Sensor 83 in Basel, starting this project with its foil resistor know-how. To enter the gauge market, the company acquired the most modern equipment for computer design and analysis, plasma and ion-beam etching, as well as testing.

Importation Market

Up to now, the free market in strain gauges, which for France can be estimated to be on the order of one million units, or about 18-20 million francs, belonged almost entirely to foreign manufacturers, essentially Americans, one of which gained a dominant position.

Today, Sfernice is in a position to provide research organizations and national industrial enterprises with a range of metal grid strain gauges on flexible insulating supports, that can be used as extensometers and transducers. According to the company, the specifications of these gauges are fully comparable, and in some cases superior to those of imported products.

OEM (Original Equipment Manufacturer) Products

On this basis, Sfernice expects to recapture 20 percent of the French market by 1984, while making a particular effort on foreign markets through its international network. Only one market will not be attacked directly: that of extensometry. Mass production units have already been delivered to customers. Moreover, within its new gauge department the company will not limit itself to cemented gauges, and is already offering to users, to solve their specific problems, industrial equipment and know-how in vacuum deposited films, diffused layers, thick films, and so on.

Sfernice is offering standard gauges as well as any OEM gauge based on 2-5 micron foils in all the conventional metals. The company fabricates substrates and masks for its gauges. In general, the substrate is defined by the user, who wants to take advantage of expansion coefficients adapted to his needs. Sfernice is also offering everything that concrens the utilization of gauges, namely cements, protection products, compensation components, connectors, relays, flexible connection circuits, and so on. A 24-page catalog (among other things) can also help the user install his gauges, compensate for creep phenomena, and install force transducers.

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FABIUS PRESENTS PLAN TO ENCOURAGE FILING OF FRENCH PATENTS

Paris INDUSTRIES ET TECHNIQUES in French 10 Sep 83 p 10

[Text] Ideas are good, but patents are better; they are too neglected. Twenty steps, some of them tax-related, are being taken to awaken businessmen and researcher's interest.

In an era when technology is undergoing a veritable explosion, bringing in an avalanche of technological problems as well as answers, solutions which are the object of thousands of patent applications, France is napping. In 1983, French applications for patents in France have decreased by one third from 1971 (10,700 against 14,962). Paralleling this trend, applications of foreign origin for French patents, including those filed through European channels and through the PCT (Patent Corporation Treaty), are on the increase. Global statistics reflect the attitude of the French economic factors: public research laboratories and technical centers file too few applications; French companies, and this is what hurts most, have not integrated patents in their overall strategy. At the Council of Ministers of 3 August, Mr Fabius presented a plan for the development of patents and licenses which includes 20 steps which will be implemented before the end of the year. In order to encourage people to apply for patents, the tax regulations will be improved: extension of the long-term value-added to non exclusive license grants, advantages for inventors creating their own company to market one of their own patents, inclusion of expenses related to industrial property in the computation of tax credits. The availability of patents will be made easier and less costly. ANVAR [National Agency for the Implementation of Research] will give financial support to small and medium businesses planning to file abroad. INPI [National Institute of Industrial Property] will pick-up some of the filing procedure taxes. ANVAR and INPI will undertake direct information action with businesses. In the long term, the effort must be directed at the base. Engineering schools and some branches of the universities will include courses on industrial property in their curriculum. Furthermore, regional organizations such as CCI, delegations, ANVAR, will provide basic training on patents. They will also facilitate contacts between parties offering and those seeking technologies. All this assuming that everyone respects the rules of the patents game. The protection of patents exploitation will be better assured by a fast procedure prohibiting counterfeiting and the development of a legal

recourse system to cover the cost of the contentions. A law proposal concerning the protection of designs and industrial models, and proposals on the legal protection of software developers will be presented before year-end.

	Applications from French sources	Applications from foreign sources including those from European channels and PCT	Ratio of applications from French sources to total applications
1971	14,962	33,009	31.19%
1973	13,458	33,776	28.49%
1978	11,445	29,130	28.20%
1981	10,945	36,077	23.27%
1982	10,681	36,671	22.55%

Year 1982	Applications in France	French applications abroad
FRG	8,991	3,270
USA	8,727	3,390
Japan	4,976	1,739
UK	2,779	3,070

The imbalance in the area of patents is costing FF 1.5 billion per year, not taking into account the "cost" of technological dependence.

6445
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SCIENTIFIC AND INDUSTRIAL POLICY

NETHERLANDS FOUNDS 'SCIENCE PARK' IN GRONINGEN

Rijswijk PT AKTUEEL in Dutch 14 Sep 83 p 1

[Article: "First Dutch Science Park Comes to Groningen"]

> [Text] The Science Park in Groningen, a para-university organization for the application and commercialization of scientific research results, can now be opened.

Undersecretary Van Zeil of Economic Affairs has granted a subsidy of 7.8 million guilders over the next 5 years for this. Half of this amount is being granted within the framework of the Integral Structure Plan for the North of the Country (ISP). In addition, the Ministry of Education and Science and the State University at Groningen [RUG] are also making contributions. The Science Park in Groningen is the first of its type in the country; consequently, the project has an experimental character. The Science Park will be a para-university organization in the form of a foundation, the administrative board of which will shortly be installed.

Science Park has as its goal to help bridge the gap between the results of purely scientific research and the application and commercialization of suitable scientific findings. The foundation that is being established will finance and see through the necessary supplementary, application-oriented research. One of the possible forms of financing is the granting of "innovation stipends" to individual young researchers who want to test the applicability of their findings. Such developmental research falls outside the scope of the original university aims, and for that reason cannot be financed with normal university means. The foundation will look for appropriate projects which are highly promising, so that the project can be developed further, naturally over a limited time period. If feasibility is demonstrated, the project can be taken over by the company involved. Through income from patents and licenses and reimbursed service costs, an attempt will be made to have a solvent operation after a number of years.

These goals and tasks are marking the Science Park as a non-profit project development organization for application-oriented scientific research with its own resources for the financing of projects. In this way, the Science Park will be able to make an important contribution to the innovative transfer of knowledge from the university to the business world and to society. In this

respect, the new organization will be cooperating closely with the existing RUG Transfer Point, the university's mediation office for scientific consultation, information gathering and contract research.

The public support presently promised to this Groningen initiative gives the State University in Groningen the opportunity to begin a long-term experiment that is unique in our country. It is hoped that this experiment will lead to a strengthening of existing companies and to the emergence of new eminent industry, in the northern region as well as elsewhere. Similar experiments are also going on in other European countries and in the United States. They all have as their goal to have the results of university scientific research sent to the business world faster and more efficiently than had heretofore been the case. With its large natural science faculty with various technical courses of study and a medical faculty with an eminent academic hospital, the Groningen university is a pre-eminently appropriate site for such an ambitious test project.

12271
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SCIENTIFIC AND INDUSTRIAL POLICY

CGE, THOMSON PLANTS, PERSONNEL AFFECTED BY NEW AGREEMENT

Paris L'USINE NOUVELLE in French 29 Sep 83 pp 72-73

[Article by Pierre Morville and Alain Pauche]

[Text] The CGE-Thomson agreement is causing a huge reshuffling, both in activities and in personnel; discussions have now shifted to the plants, where the negotiations that will be started with employees are already proving to be as complex as they are delicate.

The questions raised by the CGE-Thomson agreement, now endorsed by the government, are innumerable. While the agreement concerns primarily the two leading French electronic companies, which moreover are nationalized, it also affects a group of industrial sectors in which France's position is uneven, but certainly inadequate for hoping to win against American and strong European competition. Lastly, the agreement concerns about 300,000 persons, of which 30,000 are especially curious about their future as well as about the industrial and commercial policy that will be adopted. For once, the use of superlatives is not inappropriate. The CGE-Thomson agreement on the distribution of their activities is the most important industrial event of the past 12 years. Nor can one overlook the fact that the director general of CGE, Georges Pebereau, and Thomson's chief executive, Alain Gomez, were able to negotiate alone the future of their respective companies.

The fact of the matter however, is that in turning over to CGE its communications (telephone, office automation, computer services) and cable departments, Thomson is refocusing on consumer electronics, weapons, and electronic components (see L'USINE NOUVELLE No 37, 15 September, p 83).

Equally important is the fact that the larger of the two groups, CGE, which has a turnover of 65.8 billion francs with 192,000 employees, becomes slightly more powerful than Thomson (47 billion and 132,000 employees) even though the agreement protocol stipulates that until 1987, 40 percent of the new Thomson Telecommunications company will be controlled by Thomson. This clearly designates the industrial leader: CGE is the one which designs, builds, and sells French telephone equipment. This is an industrial layout that had to be forced upon DGT (General Directorate for Telecommunications), which opposed

Table.

Companies and Locations	Activities	Personnel[1]
Groupe Thomson	Communications Office automation Public telephone services Wires and cables Hardware and software Mechanization	23,500
Thomson-CSF (parent company)		
Levallois	Radio-relay network	2,400
Cherbourg[2]	Radio-relay network	300
Cholet[2]	Radio-relay network	200
Toulouse	Space communications	750
Meudon	Space communications	250
Paris	Radio communications	30
Province	Radio communications	100
Paris[3]	Office automation	210
Thomson-CSF Telephone		
Boulogne	Public telephone services	860
Colombes	Public telephone services	1,500
	Private telephone services	600
Malakoff	Public telephone services	70
Rupt (Nancy)	Public telephone services	300
Marseille	Public telephone services	320
Saint-Nicolas-d'Aliermont (Rouen)	Public telephone services	20
	Private telephone services	700
Eu	Public telephone services	1,240
Laval	Public telephone services	1,000
Lannion	Public telephone services	270
Nantes	Public telephone services	1,000
Personnel de chantier	Public telephone services	670
Paris (commercial)	Private telephone services	300
Brest	Private telephone services	700
Centre-Est (commercial)	Private telephone services	236
Ouest (commercial)	Private telephone services	156
Nord-Ouest (commercial)	Private telephone services	212
Sud-Ouest (commercial)	Private telephone services	173
Ferrer-Auran		
Marseille	Private telephone services	400
LTT		
Conflans	Wires and cables	2,100
Lannion	Wires and cables	1,200
Dinard	Wires and cables	120
Personnel de chantier	Wires and cables	300
Foi (Thomson + Saint-Gobain + Corning Glass)		
Conflans	Optical fibers	50
Pithiviers	Optical fibers	80

[continued]

[continuation of table]

Companies and locations	Activities	Personnel[1]
Cabeltel		
Courbevoie	Wires and cables	40
Fumay	Wires and cables	480
Thomson-Jeumont-Cables		
Bohain	Copper and cables	560
Le Havre	Copper and cables	160
Jeumont	Copper and cables	700
Paris (Region)	Copper and cables	150
TITN		
Malakoff	Data processing systems	140
Morangis	Data processing systems	400
Aix	Data processing systems	105
Grenoble	Data processing systems	33
Rennes	Data processing systems	14
Bordeaux	Data processing systems	3
Nancy	Data processing systems	3
CETT		
Chatou	Data processing systems	250
Answare		
Paris	Data processing systems	250
Elca[4]		
Toulouse	Data processing systems	20
AEA[4]		
Massy	Data processing systems	52
Les Andelys	Data processing systems	160
Ger	Data processing systems	30
Hotchkiss-Brandt-Sogeme		
Saint-Denis	Postal sorting	600
Bourg-les-Valence	Postal sorting and nuclear power	750
Pierrelatte	Nuclear power	50
Groupe CGE	Household appliances Military electronics and computers	6,700
Cepem		
Saint-Jean-de-la-Ruelle	Cooking and heating equipment	2,336
Saint-Louis (Haut-Rhin)	Water heaters	438
Saint-Medard-en-Jalles	Heat pumps	170
Sintra (DSM-SMTV-DME)		3,700
Arcueil	Underwater detection	
Asnieres	Military computers	
Marcq-en-Baroeul	Microelectronics	

[continued]

[continuation of table]

Notes:
1. Employees currently at work according to the latest records.
2. Provided that the radio-relay activity is well transferred.
3. Transfer of the office automation activity (the fate of the telecopy portion has not yet been determined) also involves several people in Toulouse (included in the total of 210).
4. Provisional; discussions are underway.
   In addition, the fate of the Thomson-CSF Informatique head office (about 40 persons) is not yet settled.

the totality of the project, and one that will make sense only if it makes it possible to be more competitive and more powerful than Siemens, ATT, and IBM. It is still too early to evaluate with certainty the social effects of the reshuffling between Thomson-CSF and CGE. But we can state the following:

That it concerns 24,000 Thomson employees (21,000 of which in the communications branch) and 6700 at CGE. The situation is clear for the latter: if there are no last minute surprises, they move to the Thomson payroll. For the Thomson employees, matters are more complicated: first, because some of them work in enterprises whose activities are not totally transferred to CGE; and secondly, because for the time being nothing indicates that they will move to the CGE payroll. If that is ultimately the case, they would be leaving a position which is more advantageous overall, and this would not happen without friction.

That many employment problems still remain, even if Laurent Fabius officially demands that the agreement result in an improvement in this respect. With its telephone activities, Thomson is indeed turning over to CGE some very sick branches. In the communications branch, the two enterprises had separately estimated that by 1985 their respective excess personnel would amount to 1000 people for CGE and 2500 people for Thomson. However, according to the text of the agreement signed this summer by CGE and Thomson, a comparison of the calculations made by the two companies shows them to be based on incompatible assumptions. The excess personnel should thus be estimated at double the stipulated figure--7000 persons--if the status quo is maintained. The redistribution of activities among the two manufacturers, and the synergies achieved, should reduce the surplus to 5000 people.

The two groups hope to reclassify 3000 people within the companies through an internal effort (800 for CGE; Thomson would convert two production units--Laval and Dinard?--to other activities; and the surplus personnel would have priority in the hiring plans of the two employers). The development of various PTT orders (telephone sets, Minitel, optical fiber distribution equipment) should allow the continued employment of 1000 persons. This leaves 1000 people to be reclassified within the two groups, and the minister of industry has urged Thomson and CGE to reexamine the terms of the protocol about this point.

The discussion on "the industrial agreement of the decade" thus shifts to the plants. That is why L'USINE NOUVELLE has identified the industrial enterprises concerned. They belong primarily to Thomson's communications branch and to CGE's consumer, military, and components sectors.

The table shows both the magnitude of the negotiations to be undertaken with the personnel of the units involved, and the extreme complexity of the problems raised by the necessary industrial restructuring. Each company, each subsidiary, each enterprise has its history, its culture, and its know-how, all of which make it sometimes difficult to gather together groups which yesterday were competing against each other. The successful fusions are those which impose themselves, and it is up to the leaders of the two groups to be convincing.

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BRIEFS

ITALIAN FUNDS FOR INNOVATION -- The Interministerial Committee for Industrial Policy Coördination (CIPI) has awarded more than 300 billion lire to public and private firms as incentives to technological innovation. The committee approved 53 applications, including one from Aeritalia (its investments eligible for innovation incentives came to 130 billion lire); Telettra (53 billion); Montepolimeri (80 billion lire). "For these decisions," said Budget Minister Guido Bodrato, who chaired the meeting, "CIPI held four sessions between 5 May and 8 June, in which it examined a good 100 technicological innovation applications in the sectors of chemicals and pharmaceuticals, automobiles and aeronautics, electronics and remote data-processing. As of now, we have approved some trillion lire in awards." CIPI also earmarked 500 billion lire for research contracts under national research programs (PL 46/82); 45 billion lire as contributions to the relief fund for shutdowns of steel plants. CIPI also approved 30 decisions involving industrial investments under the industry reconversion Act, going, among others, to Eridania, Pininfarina, Maserati, Aeritalia, Alfa Romeo auto, Alfa Romeo commercial vehicles, and SIAI Marchetti. [Excerpt]. [Rome NOTIZIARIO DELL ENEA in Italian Jul-Aug 83 p 42] 6182

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DATA BANKS KEYS TO INNOVATION, TECH ACQUISITION

Decbema/Fiz Data Bank Reviewed

Duesseldorf CHEMISCHE INDUSTRIE in German Aug 83 pp 458-460

[Article by Dr Reiner Eckermann]

[Text] Data banks are currently available for the most varied information needs. They are easily accessed online, direct from the work place, with advanced telecommunication techniques that span continents. It is therefore unimportant whether a data bank is installed on a host computer in Germany, Europe or the United States: There is practically no delay for the user because of distances, but rather due to overloading of networks, computers or data banks because too many other users are connected.

A number of data banks are also available for chemistry. CHEMICAL ABSTRACTS is undoubtedly the leader here but there is greater emphasis on principles than application, e.g. in machine, apparatus, installation and process technologies.

DECHEMA has now developed four information systems for the latter (cf. table), which supply specific literature references and summaries, data and facts on all problems concerning chemical technique, biotechnology and construction of chemical apparatus and installations, and for development, planning and operation.

Starting with information activity for its members and the "Materials Table (since 1948) and "Rapid Literature Service" (since 1952), DECHEMA has systematically worked on the bases of its chemical-technical information and documentation systems since 1964 and found considerable support via BMFT (Federal Ministry for Technology). Under special consideration of the technical and apparatus aspects of chemical technology, the goal was development of computer-supported data bases from which various information services can be derived: searches, profile services, and magnetic tape, online and printing services.

These plans have been realized in the meantime and for a number of years now two of the services listed in the table (Chemische Technik [Chemical Technology] and Stoffdaten [Material Data]) have been offered online. This has been done most recently by Fachinformationszentrum Chemie GmbH (FIZ Chemie, Steinplatz 2, 1000 Berlin 12), established in 1981, of which DECHEMA is a partner.

In the following paper, we shall report on the present status of our information systems and on developments and trends that must be very carefully observed by producers of data bases. The two online systems will be described in more detail in two subsequent reports.

The above-mentioned plan, i.e., the movement of various information services from a single data base was first realized in the Chemische Technik information system. It contains information on all sectors of chemical technology in the form of brief reports and bibliographical references, and facilitates primarily literature searches and publication of the abstract journal DAS KONZENTRAT (The Concentrate). The corresponding online data bank is DECHEMA (Dechema Chemical Engineering Abstracts Data Bank).

In connection with this there is the Werkstoffe und Korrosion (Materials and Corrosion) information system, which makes a large part of its source material available to Chemische Technik, offering online accessibility. It is also involved in preparation of the Dechema Materials Table, which is available in printed form only. Since establishment of an independent corrosion data bank is too expensive at present, the Chemische Technik system will initially be expanded with a larger number of literature citations and abstracts.

Search and Calculation--Extensive Software

When computer technology was introduced in the sixties, there was also more intensive discussion of the use of computers for chemical technology problems, especially for planning. DECHEMA consequently set up a materials data bank and materials data system which provide the materials data information required for planning of chemical plants and apparatus. This constituted the realization of another concept specific to the planning of chemical plants: Both researched materials data as well as those calculated for given phases must be accessible, since in most cases the planning engineer is dealing with mixtures for specific sectors of the planned installation, rather than with pure materials for which it is relatively easy to determine data. However, mixture properties can, practically speaking, only be calculated since measurements are not available or too expensive. A materials data search is important if calculations produce no results or there are no calculation methods.

Currently, both types of materials data information--search and calculation--have been realized with the Dechema materials data bank "DETHERM" (Dechema Thermophysical Property Data Bank). Worldwide access to the data base at the host in Karlsruhe (INKA) presents no problem since the information is in English.

In terms of both content and the techniques used, this area is in a state of flux and development is far from complete. DECHEMA work groups and special cadres are therefore concentrating on the development of calculation methods, i.e., the conversion of thermodynamic research results into data that can be used in daily engineering practice. Extensive software has been developed and improved; it is available via the above-mentioned calculation system of the Dechema materials data service. Hence, not only those involved in development of the methods benefit but also quite generally the interested public.

The Bezugsquellen (sources of supply) information system will also have to adapt to current requirements. Since its task is to provide Achema visitors with information about Achema exhibitors, as well as to supply answers generally on manufacturers and suppliers of apparatus and facilities, it is an obvious step to build up a single computer-supported data base for the many types of applications. This should contain not only data on manufacturers and suppliers but also product specifications. The applications include preparation of printed information, e.g., of the Achema Yearbook and Handbook; on online service for Achema visitors, either in connection with "ARIADNE", the exhibit guide, or as an exhibit information system; and finally, utilization as a worldwide online service, whereby only a partial quantity of the memory adapted to a given application will be used. Since it is desirable for the companies whose entries are accepted in the data bank to participate in the input costs, so that cost of the online operation will be as favorable as possible for the user, system development will have to involve these companies. Pertinent projects are under way.

Data base producers must not lose sight of the fact that the users' queries will change over time and the content profiles of the data banks must therefore be expanded. Since the users' demands will increase because of the abundant data bank supply and the possibility for independent online search of "all" sources, producers will have to make increasing use of the information center for questions that cannot be answered by a data bank manufacturer, either because he has not yet taken into account the "subsequently queried" results or because these are not yet available, at least in published form.

Expansion and Systems Analysis

This is very clearly reflected in the DECHEMA data banks where contents have currently been expanded to include areas such as environmental protection, biotechnology, energy and raw material problems, safety technology and computer-based planning. This increases the value of information that to date has not been requested or that was also not available. This in turn affects the data banks themselves and the necessary additional system development.

The new areas must therefore be systematically incorporated, thesauri must be expanded, and additional data acquired and entered. Additional developmental work has been programmed. In the case of materials data, this has led to intensive research and excellent results in the area of applied thermodynamics. Moreover, comparative data bank studies must continuously assess the strengths and weaknesses of their own systems, finding possibilities for closing gaps in the supply.

Moreover, there are major developments in fact data banks worldwide. Since Germany is limited in really comprehensive literature data banks for chemistry (Chemical Abstracts is moving toward a monopoly with corresponding market domination and exploitation), our stated goal must be at least to make progress in the area of fact data banks and to maintain that progress.

For example, with its materials data banks, DECHEMA provides an instrument that fulfills maximum demands with currently possible means and that is unique all over the world. As the many contacts and visits in the United States have shown, there is nothing comparable even in North America.

Expansion of the online market will continue to be a prime goal of the Dechema data banks. Online utilization of the data banks is greatly exceeding the queries processed by the search service in response to client request (by a factor of more than 10). This trend will be intensified in the future and it must prompt opening up of the European and extra-European market. Until recently, online access to our data bases from North America broke down in so far as technical realization was concerned (although the reverse movement had been feasible for a long time). But in the meantime, the Federal Postal Service has created the prerequisites for corresponding telecommunications connections so that chances are good for overseas supplies without moving our data banks.

A study on export possibilities for European data banks to North America, which was performed in this connection by Diebold and Cuadra upon request of the EEC, makes explicit mention of the DETHERM Dechema materials data bank and the DECHEMA literature data bank as two of the approximately 35 candidates for export.

The subsequent development of the data banks will follow a dual course: Online operation of large data bases will compete with in-house use of computer programs and smaller "personal" data banks, given the rapid development of microcomputer technology with built-in and peripheral memories, which until recently were possible with large computers only. With 32-bit technology, more complicated calculations can be performed without sacrificing accuracy. Such microcomputers are also especially suitable for implementation of data banks and extensive computer software in planning. This will open a vast area for natural science technologly application in the work place.

The prerequisite for frequent utilization of data banks is a favorable price/performance ratio. For the data bank manufacturer, as well as for any producer, this means continuous revision and improvement of production methods. However, there is no latitude for intellectual input, since this must be paid in accordance with performance and we are still far away from automatic evaluation based on relevant contents. Perhaps the development of new input techniques, e.g mechanical language detection, will soon result in possibilities for economizing--up to a certain limit--in automatic data processing.

The "usefulness" of the information is undisputed, but in many cases it is not easily measurable. In other words, the user can only infrequently carry out a cost/use analysis and would therefore want to accept only such prices as reflect this characteristic of non-measurability. This is one of the most important reasons for the poor earnings of the data bank manufacturers.

Consequently, pressure that pushes costs steadily upward, caused chiefly by increasing personnel expenditures which are practically impossible to control, is offset by pressure that pushes prices steadily downward. The data bank manufacturer must meet this challenge with flexibility and adaptability. On the other hand, the public must remain aware of its obligation to support data banks, if the innovative capacity of our society is not to be lost.

Dechema/Fiz Chemie GmbH Information Systems for Chemical Technology

Information Systems	Chemical Technology	Materials and Corrosion	Material Data	Sources of Supply
Subjects	Chem. tech., biotechnology, chem. apparatus construction, environ. prot.	Behavior of materials vis-a-vis corrosive media	Phys.-chem. properties of chem. compounds and mixtures	Manufacturers and suppliers of plants, apparatus and equipment
Memory	EDV memory (as of 1975) Card file (until 1974	EDV memory (10 percent of total material) Card file	EDV memory	EDV memory Card file Brochure file Catalogues
Services	Data bank connection Retrospectives Searches	Data bank connection** Retrospectives Searches	Data bank connection Data searches Data estimation Data calculation Data analysis	
	Abstract jour. DAS KONZENTRAT	Abstr. jour. DAS KONZENTRAT partial ed. 8		
	Standard profiles Individual profiles Tape service	Indiv. profiles Tape service	Tape service Data collections	
			Handbooks: Dechema Materials Table	Handbooks: Achema Yearbook Handbook, Environ. Protection & Energy Saving

[continued on next page]

Information Systems	Chemical Technology	Materials and Corrosion	Material Data	Sources of Supply
	Dechema Thesaurus for Chem. Technology	Thesaurus Materials a. Corrosion Information Consultation Research on request	Information Consultation Data Bank syst. Programming	Information
Data Banks	Dechema	Dechema**	DETHERM	
Online Access	FIZ Technik, Frankfurt* Hoechst AG, Frankfurt		GID, Frankfurt*	

* EURONET, DATEX P

** Ten percent of all materials are stored in the CHEMISCHE TECHNIK data base and can be searched with the Dechema data bank.

Use in Chemical/Biochemical Research

Duesseldorf CHEMISCHE INDUSTRIE in German Sep 83 p 526-528

[Article by Dr Guenther Loose]

[Text] The first part contained a survey on the DECHEMA data banks made available by Fachinformationszentrum [FIZ] Chemie (Fachinformationszentrum Chemie GmbH, Steinplatz 2, 1000 Berlin 12)(Part I: R. Eckermann: Informationssysteme und Datenbanken fuer die Chemische Technik im FIZ Chemie [presented in the first part of this related articles format as Dechema/Fiz Data Bank Reviewed], Chem. Ind. 35:458-460, August 1983). The Chemische Technik information system will be taken up in greater detail in this article.

It is very time-consuming to search books and periodicals for specialized literature that is of interest and the results can only be incomplete. More rapid and reliable search methods were therefore developed which produce a better yield. These methods include the so-called online searches in EDV data banks. With the help of a terminal, the desired literature can be rapidly selected from an electronic memory and displayed on the screen or paper.

Because of the speed and high degree of confidence inherent in these "self-service searches," they are steadily increasing in popularity all over the world.

Online searches use the enormous capacity of electronic memories in which numerous publications have been recorded in the form of abstracts (with the pertinent key words and bibliographical data, such as author, journal, etc.).

Some comments:

--By specific queries involving tracer words and other criteria, only those publications that are of interest and directly pertinent can be filtered out of the plethora that is available ("needle in hay stack").

--An electronic search requires only a fraction of the time needed for a conventional one. Useful results are usually available after about 30 minutes, with the input of questions and review of results on the screen or paper protocol constituting the steps that govern speed of the procedure.

--Online search is easy to learn. Moreover, at the start, users may consult with the information and computer centers that have the data banks (hosts). It may also be helpful not to start the first search independently online but to request it from an information center.

--If the results are unsatisfactory, the search can be repeated immediately with improved formulation of the question. For example, if the computer yields too much extraneous material, the question will be narrowed and made more specialized. Conversely, if it is suspected that information loss has occurred because the yield is too sparse, the search command can be expanded and additional aspects can be accessed. This "shuttling" can be repeated immediately and as often as desired until the results appear optimal.

Distribution by Subject Matter

For the area of chemical technology, where there is an extensive supply of publications, DECHEMA has established an electronic memory in which online searches can be carried out by anyone at any time.

This electronic data bank for chemical technology and biotechnology encompasses the following areas (distribution in parentheses):

1. General fundamentals: mathematics, physics, physical chemistry, chemistry, biochemistry, computer application (7 percent);

2. Laboratory techniques, analysis (4 percent);

3. Safety and environmental protection: technical regulations, dangerous substances, occupational protection (12 percent);

4. Energy and raw materials: supply, energy technology, processes and development, products (19 percent);

5. Procedural technology, reaction technology, technical chemistry: conveyance, disintegration, materials separation and combination, equilibria, kinetics, catalysis, reactors (31 percent);

6. Operational measurement technology and process regulation: apparatus, regulation, measurement conversion, process calculation systems (10 percent);

7. Apparatus, machinery and plant construction: projection, construction, assembly (4 percent);

8. Materials and corrosion: Treatment, application and damage of materials, corrosion protection (13 percent);

Since all of these areas can also pertain to biotechnology, this field was not set up as a separate area.

To build up the data bank, specialists regularly and systematically evaluate approximately 950 international journals, technical books, conference and research reports and other sources. Approximately 10,000 brief reports (abstracts) are prepared from these annually. At present (fall 1983), the DECHEMA literature data bank (Dechema Chemical Engineering Abstracts Data Bank) contains approximately 60,000 abstracts. It is supplemented monthly and encompasses findings, experience and developments relevant to chemical engineering from the specialized literature that has appeared since 1975.

Rapid Adaptation to New Technology

Since no specialized area is static, a repository of this type can provide optimal results only if it keeps pace with technical development. Consequently, modifications and innovations as well as shifts in emphasis are taken into

consideration for chemical technology. For example, mention might be made of the use of computers in the planning and operation of chemical plants, safety questions and environmental protection, energy conservation and preservation of raw materials. Biotechnology occupies an equal rank next to chemical technology since, in its work, it basically makes use of the methods produced in chemical technology.

The abstracts (brief reports) collected in the data bank contain the requisite bibliographical data in addition to the summary of the contents of the publication. In a search, they appear as a print out, as shown in the following illustration.

DECHEMA

Literature Data Bank

TI: Gas holdup and bubble diameters in pressurized gas-liquid stirred vessels

GT: Gasinhalt und Blasendurchmesser in Ruehrgefaessen mit Druckgas und Fluessigkeit

AB: Gas uptake of liquids in stirred vessels is investigated as a parameter that is important for material conversion in heterogeneous systems. Accordingly, as gas pressure increases, the quantity of gas contained in the system increases while, at the same time, the bubble diameter decreases. Similarly, if the distribution of the gas flow at the entry site is taken into consideration, relationships can be established between stirring energy and distribution of gas flow. Bubble size becomes smaller with increased stirring velocity, but gradually attains a constant value. The observed phenomena are expressed in the form of equations that permit enlargement of pressure-reaction vessels. (Language: English)

CT: Reaction apparatus with stirring device; mathematical model; [to] gas; energy requirement; liquid; bubble; holdup; equation; construction; pressure dependence.

AU: Sridhar, T.: Potter, O. E.

SO: IND. & ENGNG. CHEM. FUNDAM. 19 (1980) 1, p 21-26 88, 1T, 26Q
An abstract (brief report) of a paper encountered in a search.

Optimal use can be made of the data bank by appropriate descriptor selection and its expedient Boolean coupling (with "AND", "OR" and "NOT"). Use of descriptors can be enhanced by supplementary utilization of other optional search terms (which do not correspond to the theasaurus). This "free text search" can be used in the title (TI, GT) or in the text of the abstract (AB); it usually yields additional information.

An Example

A search can be carried out approximately in the following manner with the above abstract serving as an exmaple.

Step 1: The problem is fixed in detail: "Connection of gas holdup and bubble size in stirred vessels."

Step 2: Establishment of search question for the data bank as a combination of thesaurus descriptors: "Gas AND bubble AND reaction apparatus with stirring device"; in other words, only those publications are to be searched in which these three descriptors occur simultaneously (next to each other).

Step 3: Mechanical research with subsequent review of results on screen or rapid-printing protocol: In this case, the computer retrieves extraneous data in addition to the pertinent publications because the descriptor "gas" was apparently too general. The user infers from this that instead of "gas", the descriptor should be limited to "[to] gas." He also hopes that additional consideration of the descriptor "emulsifying reactor" will supply other sources because the latter is similar to a reaction apparatus with a stirring device.

Step 4: Second, improved search:

The question is changed to read "[to] gas AND bubble AND reaction apparatus with a stirring device OR emulsifying reactor."

The following information is provided on a paper:

TI: Title

GT: German title (original or translation)

AB: Abstract (including the language of the paper)

CT: Control terms = search terms agreed on or standardized, key words, descriptors. These are listed in an established specialized dictionary ("thesaurus", cf. below)

AU: Author

SO: Source = journal with data on volume, year, number and pages, as well as number of illustrations (B), tables (T) and literature references or sources (Q).

According to or within these data, searches can be carried out based on certain criteria such as specialized vocabulary, names of authors, journal titles, etc.

The most important search element is the thesaurus descriptor (CT), which should result in reliable, non-extraneous and pertinent references to papers on the desired subject. For this purpose, each publication determines the principle subjects which are stored in the form of descriptors (between 10 and 20 per publication). They are established with the help of the DECHEMA THESAURUS

FEUR DIE CHEMISCHE TECHNIK (DECHEMA Thesaurus for Chemical Technology), which contains approximately 26,000 of the current specialized terms. These have been established in an obligatory manner for storage and search purposes since control terms must be uniform and clear for precise querying of the data bank. A thesaurus is a specialized alphabetically arranged vocabulary which for each concept lists the hierarchies (main and subordinate concepts) and synonyms.

A thesaurus is not a rigid system; rather it is continuously adapted to developments in terminology. New specialized vocabulary is incorporated. At present, e.g. descriptors are being collected from biotechnology and integrated into the hierarchy.

A search is now being made for those papers which, in addition to "[to] gas" and "bubble" contain "reaction apparatus with stirring device" or "emulsifying reactor" as the third descriptor.

The results will then be satisfactory and also contain the above-mentioned abstract.

This abstract would also be retrieved if queries derived from other areas of interest. It would also turn up if, e.g., literature were desired on holdup and this descriptor were used, or if equations were sought for construction of larger stirring reactors and the query "reaction apparatus with stirring device AND equation AND construction" were presented. The abstract also appears if the energy requirements for these reaction apparatus are of interest and the appropriate descriptors were used.

This illustrates another advantage of the modern information system: A paper can be retrieved in various ways and thus serves for very varied interests. A specific publication can be found more easily and more reliable than with a conventional search in journals.

English Terminology Included

As previously mentioned, access to the publications can be gained not only via the specialized content (by means of descriptors or free text concepts), but also via other control elements such as the name of the author, journal title, type of publication (book, conference report) or language of the report. Finally, English terminology was included in the system: Free text search makes possible access to the English titles and the abstracts, some of which are stored in English. Moreover, the English version of the Dechema thesaurus is currently being implemented, which will in many cases eliminate the free text search.

Hence, this is a literature compilation that is "custom tailored" for the user. Relevant data can therefore be obtained from the world literature on almost any given query.

The multiple possibilities that are available are shown by an arbitrary selection of queries presented to the DECHEMA information center:

--Analysis of dust emissions

--Separation of copper by ion exchange

--Sealing of machine bearings against aggressive media

--Dependence of heat transfer on surface roughness

--Cathodic dip varnishing

--Viscosity measurement

--Obtaining of biogas

--Obtaining of hydrogen from bacteria

--Obtaining of pectins

--Purfication of waste acids

--Separation of aceotropic mixtures

The DECHEMA data bank can be used online with two search systems that differ in command language and strategy:

1. Using thesaurus descriptors as the chief search elements (descriptor oriented) with the DIRS-GRIPS system on the INKA host in Karlsruhe;

2. Primarily as free text search with the STAIRS system on the host at Hoechst AG, Frankfurt.

This is a worldwide supply, the use of which necessitates only one terminal with a transmission velocity between 300 and 2,400 Baud (in the form of a teletype or display apparatus with a printer). Any telephonic connection is suitable for transmission; Datex P, EURONET or TYMNET are available as nets.

The above survey is intended as a preliminary review of the versatile possibilities of online search. Additional possibilities for improvement or refinements in search strategy are available for the routine user.

The current position of the online approach is shown by its frequency of use as compared with the searches performed by information centers in response to client requests. The number of online searches by final users is already about 10 times greater than the number of requested searches performed by "information suppliers."

Finally, it should be mentioned that in addition to online searches and the client-requested searches performed by the DECHEMA information center, the data bank is available on magnetic carriers for users who would like to carry out searches internally on their own computer facilities.

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